Using Complexity Theory to Understand the Organisational Response to Resurgent Tuberculosis Across London

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Dedication

This work is dedicated to my parents, Joyce, and the late Ted Trenholm, with deep gratitude for a lifetime of unwavering love and support.

Acknowledgements

I am indebted to my supervisor, Professor Ewan Ferlie, for his guidance and advice during the 3.5 or so years it has taken me to research and write this thesis. I have learned a great deal during this time. And yes, Ewan, it was difficult keeping it to 100,000 words! Thank you, too, for your help in keeping me (more-or-less) employed since arriving in London and for sharing some good laughs and great conversations along the way.

Members of the London TB Commissioning Board and Clinical Working Group have been instrumental in facilitating this research. I owe a particular debt of gratitude to Ms. Lynn Altass for opening the door into the world of TB control in London, and to Mr. Nick Relph for allowing me to pass through. I feel privileged to have seen firsthand the extreme challenges facing the highly committed professionals working to combat TB in London. I am also thankful to the dozens of members of London's TB control community, both past and present, who were so generous with their time and insights. Many research participants were incredibly open, frank and honest in sharing their experiences and this contributed greatly to this research.

I will never live long enough to repay and adequately thank my amazing Mother. I have said it many times, but I really did win the jackpot in the parental lottery. Mom, you inspire me every single day and without you and Dad, I would not have written this thesis. But I promise that this really is the end of my formal educational pursuits!

I have been blessed with an abundance of riches, including an incredible circle of friends without whom my life would be much less full. Thank you, Ojelanki, for showing me what it is to be a good scientist, and for your support. And a great group of girlfriends, old and new, have each contributed in their own special way during this PhD journey. Wendy, Marion, Tessa and Jeannie: thank you from the bottom of my heart for your collective generosity, humour and support. Life would be so much less fun and interesting without you all.

Abstract of the Thesis

This thesis analyses the organisational response to resurgent tuberculosis (TB) across London. Tuberculosis in modern London reached its lowest recorded rate in 1987, but since that time there have been almost annual year on year increases, with the rate climbing by 50% between 1999 and 2009 alone. The rate of drug resistant TB is also increasing at a worrying pace.

This research uses a novel complexity theory approach to analysis but empirically finds that positive features of complexity theory were crowded out by an embedded New Public Management paradigm. This study is qualitative and narrative-based, using complexity theory as the main theoretical framework, but also applies the theory of professional dominance and the paradigm of New Public Management (NPM) as possible alternatives. Institutionalism/archetype theory and Kingdon's (1995) theory of public policy development are also introduced to help theorise the findings.

This research found that complexity theory offers a useful, but partial, means of understanding the system responsible for TB control in London. Self-organisation, the key feature of complexity theory, was evident, but often resulted in maintaining the status quo and resisting change, in addition to infrequently resulting in innovation. The effects of highly embedded NPM practices and principles were wide-spread and powerful; its relentless preoccupation with risk aversion and control may have thwarted potentially positive benefits from self-organisation at the system level. Further, extensive NPM-inspired fragmentation almost eliminated co-adaptation (another complexity theory precept) by the TB control system to its changing environment, and reduced system fitness and robustness.

TB control was also found to occupy a lowly place in terms of public health priorities. Finally, and rather surprisingly, there was little evidence of professional (medical) dominance observed. Medical consultants, stretched for time and faced with competing priorities, often acquiesced to NHS management efforts.

LIST OF FIGURES

Abbreviations Used

DH	Department of Health
F&T	Find and Treat
HPA	Health Protection Agency
InR-TB	Isoniazid Resistant TB
MDRTB	Multi Drug Resistant TB
NHS	National Health Service
NPM	New Public Management
PCT	Primary Care Trust

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CHAPTER 1: INTRODUCTION

Background and Context

This thesis analyses the organisational response to resurgent tuberculosis (TB) across London. The incidence of this ancient disease, once thought close to eradication, has been on a relentless rise in London for over two decades. Starting in the post-war era, TB rates in the UK, including London, steadily declined; but in 1987 this trend surprisingly reversed. Since that time, there have been almost consistent year-on-year increases in the numbers of Londoners developing active tuberculosis.

Global TB rates peaked in 2002 and have been on a slow but steady downward trajectory since that time (World Health Organization 2011). This means most large cities in the world have also seen their TB rates fall, so London's inability to mirror this trend is puzzling and has serious consequences for those who are infected with the disease. Rates in New York City, for instance, have fallen by 82% since reaching their peak in 1992, and Barcelona reduced its TB rate by 65% between 1991-2008. In London, since 1987, TB rates have increased by approximately 100%. Of particular concern are the small, yet relentless, increases in the rates of drug-resistant TB.

The Nature of TB Services in London

There are approximately 70 different entities involved with TB control across London, but there is no central co-ordinating function in place. The system is highly fragmented, with TB services delivered by approximately 31 different TB clinics. These clinics house dozens of different employers (mainly different acute trusts and Primary Care Trusts), and even within the same clinic, nurses and doctors are sometimes employed by two or three different organisations. In addition, the clinics regularly interact with a variety of external entities which are also implicated in controlling TB in London. Some of these additional TB control system stakeholders include microbiology laboratories, members of the Find & Treat team (outreach workers), privatised prisoner transportation services (when prisoners infected with TB need to visit a clinic), and Health Protection Agency officials. The result is numerous relationships and dynamics at play across the system, rendering it a useful site to undertake a complexity theory study.

TB infection rates vary widely across the city, as will be discussed in Chapter Two. Perhaps not surprisingly, then, there is considerable inconsistency across the clinics in terms of service delivery, both in the quality and the nature of the services provided.

Overall, the TB control system in London has been highly reticent to adopt successful approaches used in other jurisdictions, or even those piloted within London itself. The system has largely been unable to adapt to the current reality of high levels of TB infection in the city. Since (quiet) acknowledgement in the mid-1990s that TB was indeed a problem in London, the issue has been studied extensively, resulting in dozens of recommendations for action. However, little change has been observed in how the TB control system responds, and rates continue to climb. Despite being extensively studied – 14 reports examining TB control in London have been produced since 1996 – the resurgence of this serious, communicable disease occupies a lowly place on the public health policy agenda in London.

It is important to acknowledge the broader environmental context in which the above scenario has been unfolding; namely, within a healthcare system which has been heavily influenced by decades of New Public Management reforms. These reforms have been significant and London's TB control system has not been immune from their impact; on the contrary, they have exerted considerable influence on how the system has responded.

It is useful, therefore, to understand why and how the organisational response to TB control in London has struggled and met with only limited success. Complexity theory is used in this research to try and explain this phenomenon. Other theoretical frameworks (professional dominance, New Public Management and Kingdon's [1995] theory on public policy agenda setting) are also introduced, although complexity theory comprises the primary theoretical focus of the research.

Gaps to be Filled by this Research

This research is complexity theory-led and seeks to respond to three particular gaps identified in the complexity theory literature:

1. A general lack of complexity theory-informed empirical research;
2. A need for such research analysing the management of complex organisational phenomena, notably including epidemics; and,
3. A significant lack of research which highlights the important role played by the macro context of the political economy (here embedded New Public Management reforms) in which complex systems function.

The research also fills an important and relevant health policy empirical gap, in that TB control in London, while well studied from epidemiological and sociological perspectives, has not been analysed organisationally.

This thesis uses (mostly) case-based, longitudinal, qualitative research to analyse London's TB control system and its organisational response to resurgent TB infection in the city. As noted, its primary conceptual framework is complexity theory, but it also applies two other less novel, and better established perspectives – the theory of professional (medical) dominance and the New Public Management (NPM) paradigm, as alternative templates. Complexity theory was chosen because of its focus on the importance and role of multiple relationships and dynamics within a system and its capacity to recognise the "dynamic connections between population health, health policy and health care" (Curtis & Riva 2009:519). Professional dominance and NPM were chosen as alternatives because they have both been widely, and successfully, applied within healthcare research as explanatory frameworks for a variety of observed phenomena. As with complexity theory, professional dominance and NPM also lend themselves to a system-level study, another important consideration here.

As a result of induction, it later became necessary to add a fourth theoretical framework; namely, Kingdon's (1995) theory of public policy development and agenda setting. This key inductive finding, which is discussed at length in Chapter Seven, concerns the low policy priority attached to TB control in London. Kingdon's theory explains why and how some "conditions" become "problems" which find a place on the public policy agenda and are addressed by policy makers, whilst others do not. This seemed a particularly valuable and relevant framework to analyse and theorise how and why TB control has no place on London's public health policy agenda.

This finding also necessitated the addition of the fifth research question, as seen below.

Research Questions

This research addresses the following questions:

1. What is the nature of the organisational response to resurgent TB in London?

2. What is the contribution of complexity theory features (and/or professional dominance and/or New Public Management features) in analysing the organisational response to this phenomenon?

3. Why does the organisational response to resurgent TB in London illustrate these features?, i.e., what are the mechanisms and structures which explain this organisational response?

4. Does complexity theory provide a theoretical basis for understanding the role of the New Public Management paradigm and practices within this case?

5. What perspective might Kingdon's (1995) theory of public policy development offer on TB control in London?

The table which follows provides an overview of these questions, along with why they were developed for this research and the research strategy used to address each.

Research Question	Research Strategy Used	Justification/Objective
What is the nature of the organisational response to resurgent TB in London?	Induction/ Retroduction	To develop a deep understanding of the organising principles and practices which characterise London's TB control system, as required to identify components of each of the three theoretical frameworks used in the research To map and understand, holistically, the relationships and dynamics within London's TB control system, as required by a complexity theory study To identify the potential causal effects of these relationships To address the gap in research examining London's response to TB at the system level
What is the contribution of complexity theory features (and/or professional dominance and/or New Public Management features) in analysing the organisational response to this phenomenon?	Retroduction	To identify the extent to which each of the three theories can be used to understand TB control in London To respond to the broadly acknowledged dearth of empirically based complexity theory research To mitigate the potential risk of using only one theoretical framework (i.e., complexity theory), thereby imposing that theory, a priori, on the data, as either NPM or Professional Dominance might offer strong(er) explanatory power than complexity theory. To build on the well-established research approach of using three competing theoretical frameworks in a single research study
Why does the organisational response to resurgent TB in London illustrate these features?, i.e., what are the mechanisms and structures which explain this organisational response?	Retroduction	Identifying these mechanisms and structures is vital if causal relationships and organising practices are to be revealed and understood. This is important for complexity theory research and to identify NPM-based organising principles. To understand the macro context in which the system operates, as indicated by complexity theory
Does complexity theory provide a theoretical basis for understanding the role of the New Public Management paradigm and practices within this case?	Retroduction	To understand the role of the macro context in which the TB control system operates, as indicated by complexity theory. To understand the interplay between complexity theory and NPM, including the extent of NPM embeddedness
What perspective might Kingdon's (1995) theory of public policy development offer on TB control in London?	Induction/ Retroduction	To understand and theorise the low policy priority accorded to TB control in London, which emerged as a key inductive finding from the research.

FIGURE 1: OVERVIEW OF RESEARCH QUESTIONS, RESEARCH STRATEGIES AND JUSTIFICATIONS

Importance of the Research

That one of the world's leading cities is unable to execute a successful organisational and public health response to the resurgence of tuberculosis, despite the successes of other western cities in doing so, is a topic deserving of analysis. And although this thesis does not aim to develop prescriptive findings, the resulting analyses should prove helpful to healthcare and policy officials in London. On a more general level, this research responds to the well documented dearth of empirically informed complexity theory research, including within healthcare. This thesis also contributes to a developing body of complexity theory based perspectives within the public management literature, particularly through a critique of embedded NPM practices found within the UK healthcare system.

Summary of Key Findings

This research found empirical evidence in support of indicators of complexity theory-based organising within London's TB control system. However, some of these precepts manifested themselves in a negative manner, helping to explain the inertia which seems to have gripped the system for so long. This is seen as due to the strong and on-going influence within the UK healthcare sector from deeply embedded NPM-inspired principles. The research also found that medical consultants exercised limited influence and power over the organisational response to TB in London, despite being virtually universally identified by research respondents as (potentially) the dominant force within the TB control system. This unexpected finding of weak professional dominance was also attributed to the ongoing influence of NPM.

Finally, an inductive analysis of the collected data suggested tuberculosis control in London is a very low priority on both the general healthcare and the public health agendas. A health problem has not become a health issue, or in the language of Kingdon (1995), an identified condition has not become a problem. This situation is surprising given the communicable nature of TB and the growing incidence of drug resistant TB. However, the harsh "real politik" of the situation means there is little upside for key players and entities within the system to expend political capital in pushing TB control up the health policy agenda and advancing the necessary reforms to improve the current system.

Structure of the Thesis

The structure of this thesis is as follows. Following this introductory chapter, Chapter Two sets the overall context in which this research has been undertaken. It tells the

policy story of TB in London and offers a historical and epidemiological overview of the disease. The chapter offers comparative data on tuberculosis in other large cities, examines factors underlying continued high TB rates in London, and concludes with a discussion regarding the very serious issue of drug resistant TB.

Chapters Three and Four introduce readers to the three initial theoretical frameworks used in the research: complexity theory, professional dominance and New Public Management (NPM). The chapters critically review the literatures underpinning these frameworks, and the major tenets of each framework are discussed. Chapter Three focuses solely on complexity theory, the main conceptual framework used, and, as it is a relatively new and novel theory (or, more accurately, a group of theories), readers are provided with a "primer" on the subject. Gaps in the literature which are filled by this research are identified, and five key elements from the theory are derived for operational application. Chapter Four analyses professional dominance and NPM, the secondary, competing frameworks used in this thesis. As with Chapter Three, five "signs and symptoms" derived from each of these two literatures are identified for operationalisation. Kingdon's (1995) theory of public policy agenda setting is also introduced, as it will be used to later in the thesis to theorise a key inductive finding from the research, the low policy priority accorded to TB control in London.

Chapter Five presents a methodological discussion on the chosen research paradigm (critical realism), the research strategy applied (case study) and the resulting methodological implications for data collection and analyses. It is recognised that the combination of complexity theory and critical realism, whilst a well-supported pairing in the literature, represents a departure from many traditional designs. The chapter discusses this combination and resulting methodological implications.

Chapters Six and Seven contain the empirical findings from this research. Chapter Six provides an analytic history of the overall organisational and management response to London's TB epidemic, along with a comparator case study contrasting New York City's response to its recent TB epidemic with London's response. Chapter Seven provides three additional "mini" yet strategically important case studies derived from collected data, each offering a distinct narrative and perspective on London's TB control system. The objective is to provide highly contextualised and detailed renderings of different aspects of the TB control system in action. This chapter also presents the empirical findings, which emerged inductively, regarding the low policy priority associated with TB control in London.

Chapter Eight contains a detailed theoretical elaboration on the research, in which the empirical findings presented in the previous two chapters are more fully theorised. The chapter discusses the observed interaction between complexity theory and NPM, or specifically, the impact of embedded NPM features (particularly quasi-markets, managerialism and a need for control) within UK healthcare on some complexity theory-based features (especially self-organisation, emergent innovation and co-adaptation) as apparent within London's TB control system. A contribution to knowledge arising from this research is identified in terms of the negative impact of embedded NPM reforms. Continuing with theoretical conceptualisation, Chapter Eight also focuses on a major inductive finding cited previously– the remarkably low priority accorded to TB control in London and the resulting implications. Kindgon's (1995) theory of public policy development and agenda setting is introduced as a tool for understanding and explaining this phenomenon. The complexity theory concepts of self-organisation and the importance of historicity/initial conditions are re-introduced to augment the analysis. A second theoretical contribution is thereby defined.

The thesis concludes with Chapter Nine, a summary of the main findings of the research, implications for public policy, and some suggestions for future research. Reflections on the thesis are also offered.

Concluding Remarks and Overall Contribution

This thesis seeks to fill identified theoretical and empirical gaps in the existing bodies of knowledge with regard to both complexity theory and the organisational functioning of London's TB control system. It is proposed that complexity theory offers a useful and interesting, though partial, tool, for understanding the organisational response in London to resurgent tuberculosis. Complexity theory's explanatory power was enhanced when the broader environmental context in which the healthcare system operates was also considered. Specifically, understanding the functioning of London's TB control system was improved when the contextual factors wrought by a deeply embedded New Public Management paradigm were factored into the theoretical analysis. This is the first major theoretical contribution of the thesis.

Although this research is mostly deductive, a major inductive finding emerged: TB ranks very lowly as a priority issue for current health policy, rendering its successful control almost impossible. Despite the communicable nature of the disease and an alarming recent rise in drug-resistant TB rates, the current healthcare system's response might be described as a well-informed gamble that the disease will not "jump

the fence" into mainstream London society. Kingdon's (1995) model of public policy development proved valuable for theorising this finding, and by introducing the complexity theory concepts of self-organisation and historicity, Kingdon's model was developed. This addition to Kingdon's theory represents the second major theoretical contribution of this thesis.

While the TB epidemic in London has been studied from an epidemiological and sociological perspective, to the best of our knowledge there is no prior, in-depth, system-wide organisational analysis. This is the empirical and policy related contribution of the thesis.

Having presented an overview of the research and the organisation of the thesis, the next chapter offers readers "the story of TB in London", providing important context for the later chapters.

CHAPTER TWO: Tuberculosis in London: its history and management

This chapter sets the overall context for this research, including a brief discussion of the history of tuberculosis, an epidemiological overview of TB in London and the modern history of TB control efforts in the city, placing them within a broad international perspective. Following this is an overview of London's system of TB control today, with a particular focus on the turbulent environment and structure within which TB is managed.

Historical Overview

In *The White Plague: Tuberculosis, Man and Society,* René and Jean Dubos provide a fascinating social and historical account of tuberculosis, noting the disease has been endemic to London for centuries (Dubos and Dubos 1953:6-8). By the 11th century, TB was a sufficiently serious problem that Edward the Confessor, following in the footsteps of French Kings, claimed the power of "the touch" for English monarchs to cure tuberculosis. This "cure" was subsequently used for centuries, with "the largest number of persons applying to be touched... in 1684, when many of them were trampled to death in attempting to reach the hand of the king "(Dubos and Dubos 1953:8). After a brief lull in its virulence starting in the early 18th century, TB roared back with a vengeance a few decades later (Dubos and Dubos 1953:8). At the end of the 18th, and the first-half of the 19th centuries, aided by the appalling living and working conditions of the Industrial Revolution, "the White Plague" threatened "the very survival of the European race" (Dubos and Dubos 1953:10). Indeed, by the early 19th century virtually every citizen in London was infected by *mycobacterium tuberculosis*, as "the prevalence of TB infection neared 100 percent" (Gandy 2003:15), with nearly

half of London's population having active TB disease (Dubos and Dubos 1953:9). Friedrich Engels in 1845 described it thus:

> *The flushed appearance of many of the passers-by in the streets of London indicates to what an extent the polluted atmosphere of the capital, particularly in the workers' quarters, fosters the prevalence of consumption (quoted in Gandy and Zumla 2003:7)*

Gradually, over the decades which followed, improved nutrition and housing conditions helped dramatically reduce TB rates and associated deaths in the UK. TB rates began to decline in 1913 and continued to do so until 1987 when, much to everyone's surprise, the decline ended (McEvoy & Maguire 1995). Until the mid-1980s, public health officials around the world spoke of being on the brink of "eradicating" TB. However, today terms such as "containment" and "control" convey a new understanding and approach in the global battle against tuberculosis. In 2000, Dr. Gro Harlem Brundtland, then Director-General of the WHO, observed:

> *…with the development of new TB drugs and improved living conditions due to socio-economic development, TB disappeared in the lives and minds of many. We thought we had conquered TB - that it would soon be a disease of the past. But, today we are faced with a global epidemic that is killing more people that at any point in its history.*

As the 20th century drew to a close, and again today, London is battling to control this ancient and deadly disease. *Mycobacterium tuberculosis* is a formidable foe, seemingly oblivious, in its own fight for survival, to improved treatments, vaccines and living standards. As will be demonstrated in the coming pages, "the White Plague" once again poses significant public health challenges for London, particularly in terms of stopping latent infections becoming active and in controlling the onward transmission of active disease. Once diagnosed, TB patients in London receive world-class treatment and most go on to lead lives free from the disease and its complications. The challenge lies as much in improving diagnosis and screening as with treating active TB. But how to do this continues to elude London's TB control system.

Epidemiological Overview

Today, one-third of the world's population is infected with the bacteria responsible for TB (Dye et al., 1999), and although most people will never develop active disease, the World Health Organization estimates that in 2010, TB was the cause of death for 1.3-1.6 million people worldwide, second only to HIV/AIDS in global mortality (World Health

Organization 2011). In modern-day London approximately 300 people still die every year from the disease (NHS London[a] 2011). Global incidence rates of TB peaked in 2002, and while the decline since then has been slow, the rate of new infections continues to trend downward, largely due to dramatic improvements in TB control and treatment in China (World Health Organization 2011).

In London, TB rates reached their lowest recorded levels in 1987 (McEvoy & Maguire 1995, Pearson et al 1996) but the number of cases increased by 34% between 1987 and 1993 (McEvoy & Maguire 1995), and by 71% between 1988 and 1998 (Rose et al 2001). Today, over 50 people develop TB in London every week (Story and Citron 2003), more than become infected with HIV (NHS London 2011 [a]). Since 1987 there have been almost constant year-on-year increases in TB rates. By 2010, the rate of new TB infections in London, the incidence rate, was 42.6/100,000, "a slight decrease of 3.6% compared to 2009", (Health Protection Agency 2011 [a]), but by 2011 the rate rose again to 44.9/100,000, an 8% increase from 2010 , with 3588 new cases reported (see Figure 2). This represents the highest number of new cases reported in a single year since rates started climbing again in 1988 (Health Protection Agency 2012 [a,f]).

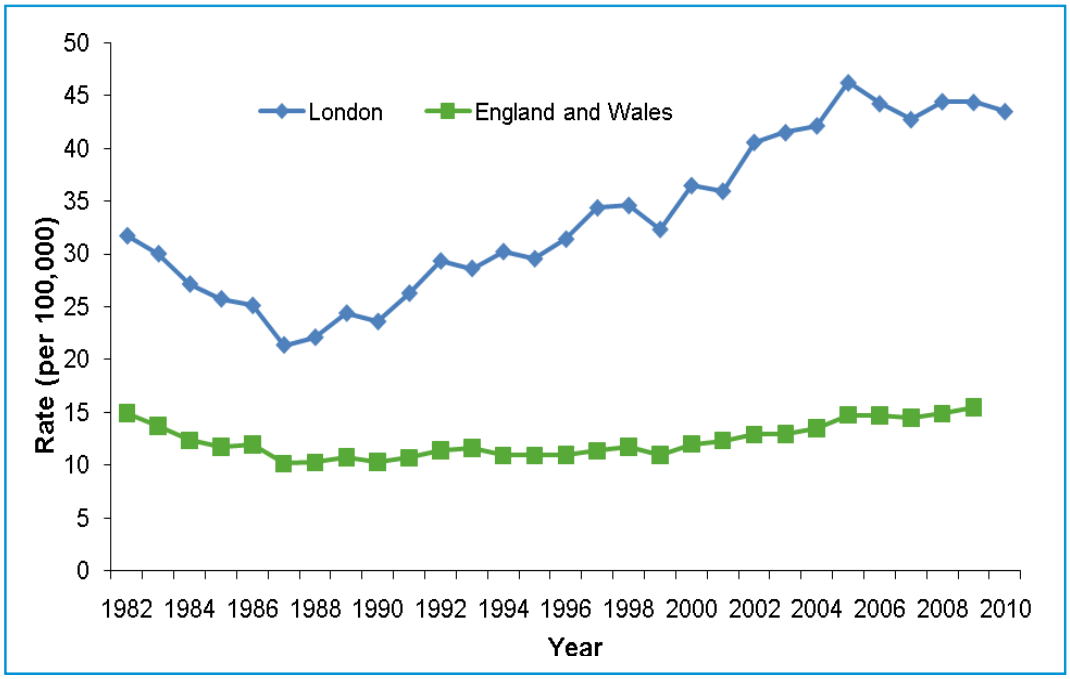


FIGURE 2: TB RATES IN LONDON VERSUS ENGLAND AND WALES, 1982-2010 (NHS LONDON 2011 [A]:10)

So whilst the global incidence of TB has been falling steadily since 2002, in London the incidence rate has increased by 11% since that year (from 40.5/100,000 in 2002 to 44.9/100,000 in 2011), securing London's dubious distinction as the TB capital of the western world.

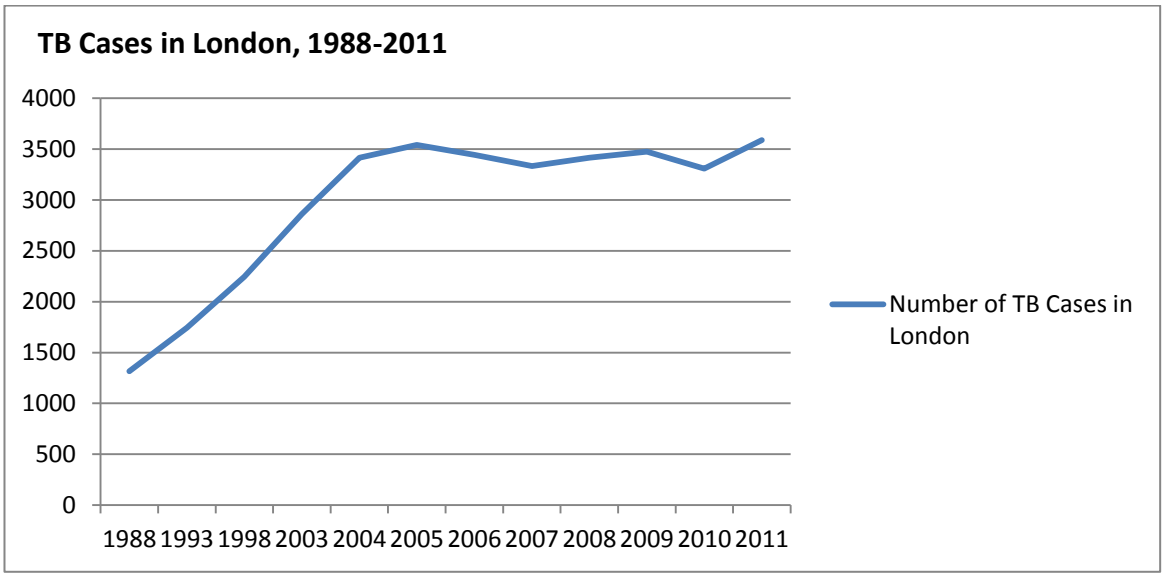


FIGURE 3: TB CASES IN LONDON, 1988-2011 (DATA COMPILED FROM VARIOUS HPA REPORTS)

These pan-London incidence figures hide striking variations amongst TB rates within the city, as can be seen in Figure 4. The Borough of Newham, for example, had an incidence rate in 2011 of 137/100,000, while Havering's rate was 8.6/100,000 (Health Protection Agency 2012[c]). In contrast, TB incidence in India was 185/100,000 in 2010 (World Health Organization 2011).

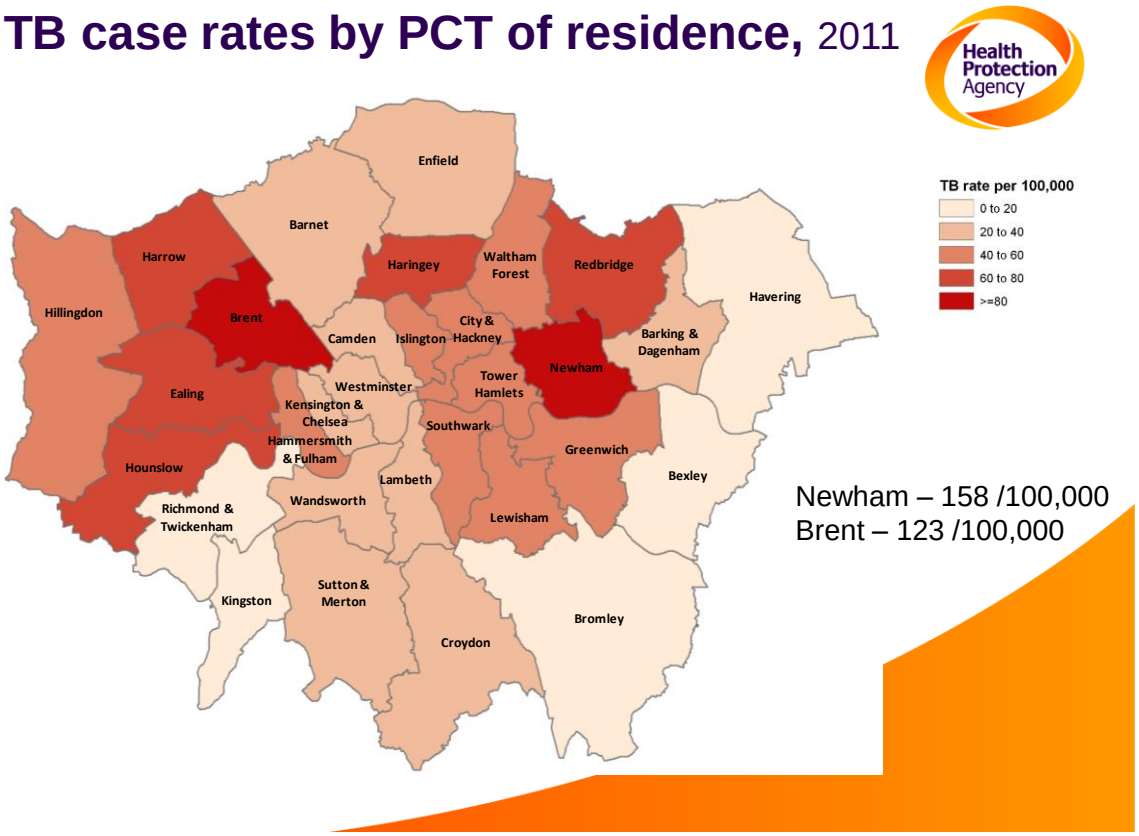


FIGURE 4: TB INFECTION RATES BY BOROUGH (HEALTH PROTECTION AGENCY 2012 [A], SLIDE 34)

The variation in incidence rates amongst Boroughs contributes to the inconsistent service levels across London and to the overall fragmentation of the system, and adds to the difficulty of developing a pan-London TB control program. As will be discussed in later chapters, this research identifies fragmentation within the TB system in London as a significant barrier to success in controlling the disease. Whilst some of the challenges are due the high levels of migration to London from countries with high rates of TB infection, managerial decisions and the New Public Management doctrine within the NHS also contribute.

A Brief Comparison with Other Large Cities

As can be seen in Figure 5, below, even though many major urban centres in Europe have high levels of migration, most have been more successful in controlling their recently resurgent TB than has London. Whilst 95% of all immigrants to Spain come from countries with high incidences of TB (Pina et al 2008), and Barcelona has similar challenges to London with high rates of TB infection amongst its homeless and drug-using populations (Solsona et al 2001), TB rates in that city fell from 68.7/100,000 to

30/100,000 between 1991-2008, a 77.5% drop. Researchers attribute Barcelona's success to high treatment completion rates (95% in Barcelona versus 86% in London), vastly increased use of Directly Observed Therapy amongst high risk patient groups (from 0% to 48%) and aggressive case management resulting in a dramatic 81% decrease in the number of "lost" patients (Rodrigo et al 2001).

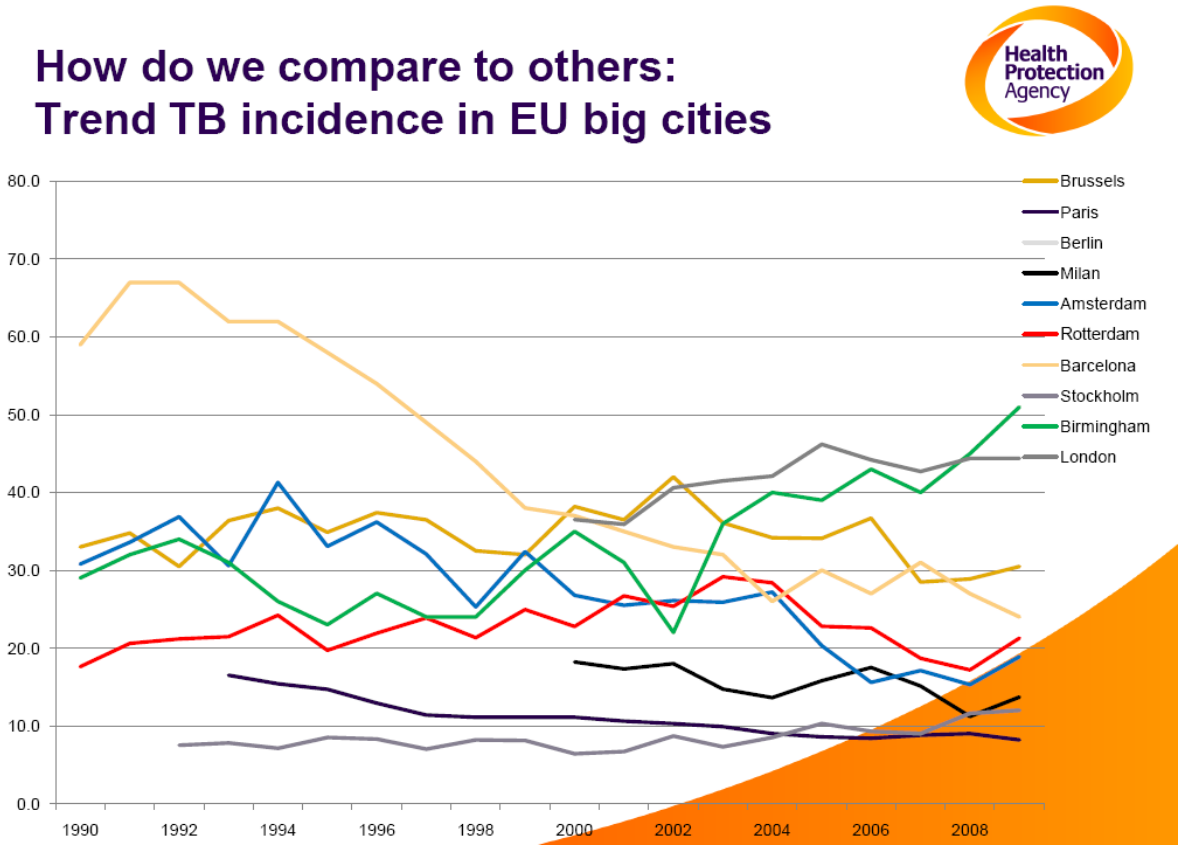


FIGURE 5: TREND TB INCIDENCE IN EU CITIES (HEALTH PROTECTION AGENCY 2011 B)

Perhaps the most relevant comparator with London, however, is New York City, as will be discussed in detail in Chapter Six. In 2011, the latest year for which data is available, that city's TB incidence rate was 8.5/100,000, less than one-quarter of London's rate (New York City Department of Health and Mental Hygiene 2012). This is the lowest rate since the city began recording such data in 1897(New York City Department of Health 2012) and represents an 82% decline from 1992, when the city launched an aggressive TB control and treatment initiative. During this same period, London's incidence rate has more than doubled (Anderson et al 2007) (see Figure 6). With similar populations of approximately 8 million, the most recent data show 689 new cases of TB reported in New York City in 2011 (New York City Department of Health and Mental Hygiene 2012) and 3588 cases in London during that same year (HPA

2012[f]). The reasons for this discrepancy, it will be argued in Chapter Six, are largely organisational. However, any "knowledge transfer" related to TB control between the two cities has been limited despite New York's approach being widely analysed by scholars and readily available to London policy makers (Coker 1998, 2000, Frieden et al 1995, Hayward and Coker 1998). More recently, there appears to be a greater openness to adopting some of the strategies and tactics used in New York City following the commissioning of the 2010 London TB Service Review and Health Needs Assessment.

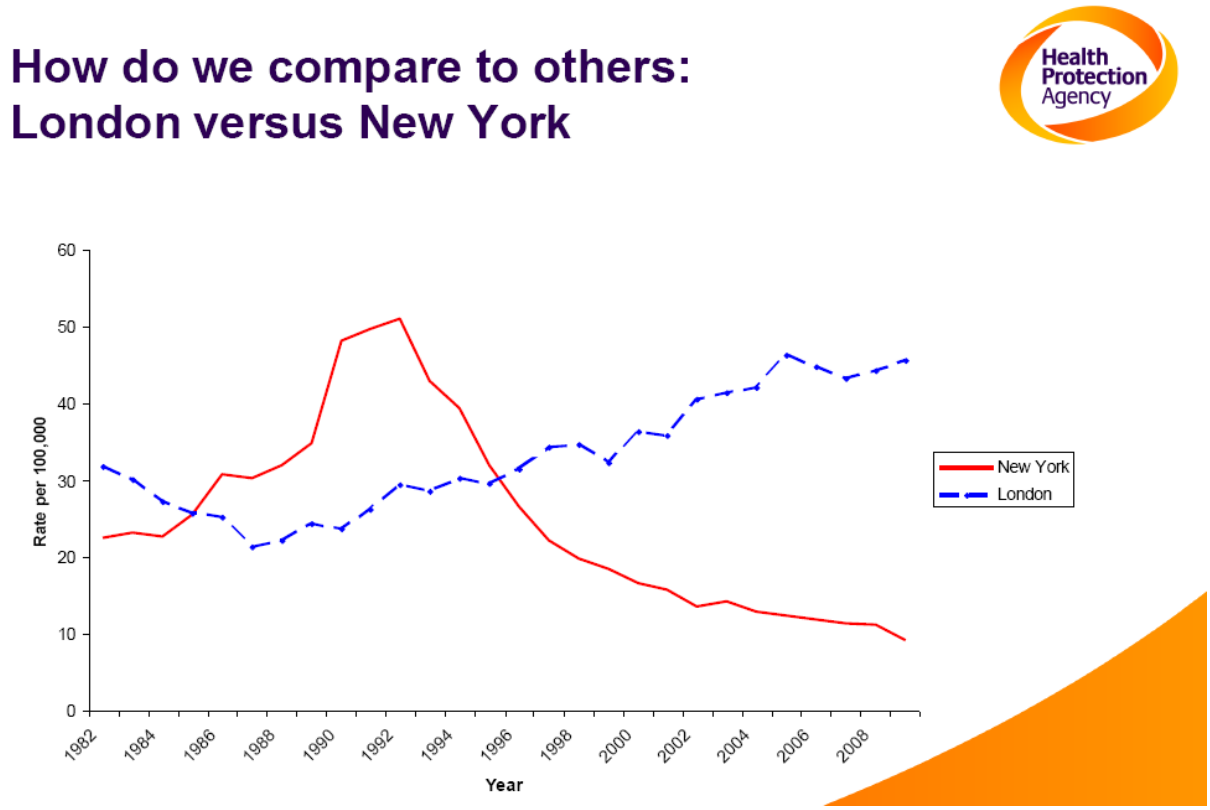


FIGURE6: TB INCIDENCE RATES IN LONDON VS. NEW YORK CITY, 1982-2008 (HEALTH PROTECTION AGENCY 2011 [B])

Factors Associated with Developing Active Tuberculosis Disease

Social Inequality

Factors associated with developing active TB infection in London include social inequality and whether a person is a migrant with minority ethnic status. The marginalised character of affected populations also affects the priority ascribed to TB compared to competing public health issues. As will be highlighted in Chapter Eight, this inability of TB to find a place on the public policy agenda has been a significant

factor in allowing the TB epidemic to continue unabated for so long. Although there are now more new TB cases annually in London than new HIV cases (3302 new TB cases vs. 2626 new HIV cases in 2010 [NHS London 2011[a]]), TB has never secured the resources or public policy support of HIV. (This issue will be revisited in Chapter Eight.)

Sociologist and complexity theorist David Byrne (1998) examines TB as a nested and complex social problem in the UK and New York highlighting the long-acknowledged relationship between TB and social inequalities, especially poor housing and inadequate nutrition. With regard to the UK in the early 20th century, he observes

> *seeing your loved ones dying of TB in the inter-war years was a radicalising process. It made people truly hate inequality. It played a part in developing the grass roots of the socialist project, particularly for women. It led to communal level action around housing provision and was plainly one of the factors in leading to a Labour victory in 1945* (p.111).

However, the capacity of TB to fuel political action in the modern-day UK was short-lived. As the face of today's typical TB patient changed, literally, (from white and UK-born to usually non-Caucasian and migrant), policymakers and decision makers in London have been able to largely ignore the disease, it is argued here.

TB has long been a disease of the poor and marginalised, and remains so (Ormerod et al 1994, Grange et al 2001, Gandy & Zumla 2002). Homelessness, illicit drug use and a history of imprisonment are all risk factors for contracting TB, and research has shown that TB is not effectively controlled amongst homeless people, prisoners and problem drug users in London (Story et al 2007). Whilst these groups comprise approximately 17% of the total TB patient population, they account for 50% of all infectious and drug resistant TB in London. When TB treatment is administered incorrectly or when the entire course of therapy is not completed, drug resistant TB may develop resulting in more complications for patients and higher rates of mortality. It is also more than 18 times more costly to treat than non-drug resistant TB - £1100 per patient versus £18,500 (NHS 2011[a]:9). This means it is vital that patients with so-called "chaotic lifestyles" be effectively treated and cured.

Migration

But within London, migrants arriving from countries with high incidence rates of TB comprise the majority of the city's TB caseload. Data indicate that in 2010 this group

accounted for 84% of all new TB cases, a figure largely unchanged over the past decade (Health Protection Agency, 2011 [a]). Figure 7 below illustrates the relative proportion of UK born to non-UK born TB patients in London between 2004-2009.

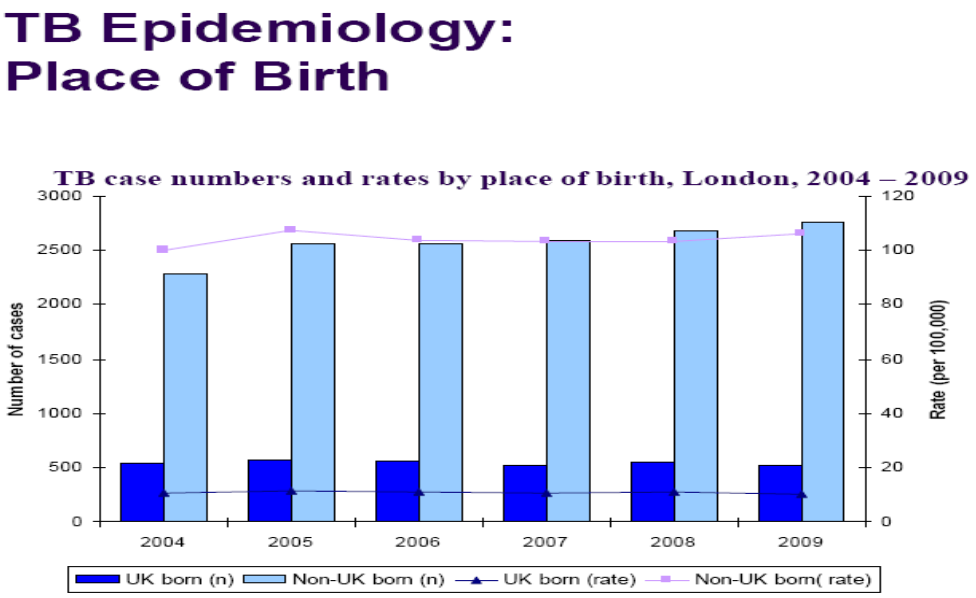


FIGURE 7: TB CASE NUMBERS AND RATES BY PLACE OF BIRTH, 2004-2009 (HEALTH PROTECTION AGENCY 2011 [A])

More specifically, five countries of origin account for 62 per cent of all TB cases in the UK (Figure 8). The data also reveal that a majority of these migrants were resident in the UK for five or more years before developing active TB, suggesting the deterioration in new arrivals' health status after relocating to the UK is a significant factor.

Country of birth	Entered UK <5 years	Entered UK ≥5 years	% all non-UK born cases
India	56%	44%	28%
Somalia	37%	63%	13%
Pakistan	43%	57%	10%
Bangladesh	42%	58%	6%
Nigeria	49%	51%	5%

FIGURE 8: MOST COMMON COUNTRIES OF ORIGIN FOR TB PATIENTS IN THE UK (HEALTH PROTECTION AGENCY 2011 [B])

Focusing excessively on migration ignores two important and related facts. First, global travel is at unprecedented levels and many people travel *from* the UK *to* areas where TB rates are high, returning home to the UK as carriers. Second, owing to London's own endemic TB, there is a significant risk that TB infection can also be acquired *from* Londoners (Story and Citron 2003:151-152):

> *this state of affairs makes paradoxical the current regulations governing the requirement for immigrants (from high incidence countries) to undergo TB screening on entering the UK…this seems ironic when many will end up living in areas of London where rates of disease are twice that in their countries of origin*.

The Health Protection Agency makes a similar point, albeit without the irony:

> *While the majority of cases continue to occur in people who were born in high incidence countries rates among the UK born have not decreased in recent years, and cases continue to occur in young children, suggesting transmission within the UK is not under control."* (Health Protection Agency[a] 2011:21)

Factors Underlying Continuing High TB Rates in London: Ineffective Screening and Unclear Policy Regarding Prophylactic Treatment

The communicable nature of TB brings with it a public health imperative not associated with many other illnesses. As noted by an infectious diseases consultant interviewed for this research, HIV is also communicable, but you have to do more than breathe in order to acquire that infection. Whilst most TB is brought into London in an inactive state by migrants, this does not preclude the importance of identifying active cases of TB, especially pulmonary disease (non-pulmonary TB is not contagious, but is still serious and can be fatal). Identifying active TB and initiating treatment is important for the health and well being of the TB sufferer and reduces onward transmission of the disease. However, a program of active case finding in London brings with it the associated political problem of inevitably higher TB rates being recorded. A former Department of Health (DH) official interviewed for this research noted:

> *If they want to reduce the real number of people contracting tuberculosis, well…they need to do proactive things, which will result in higher numbers and somebody has got to be big enough and brave enough to go to the minister and say "this has to happen."*

Screening for TB has proven challenging for the NHS. Port of entry screening within the migrant population is particularly difficult. The UK Border Agency announced in May 2012 that it will be replacing the current scheme of randomly x-raying at airports new arrivals from high TB incidence countries, with a system whereby such migrants must prove they are TB-free before being granted travel visas for the UK. This shifts the cost of screening away from the UK taxpayer to the potential migrant, the angle used to promote the policy change within the UK, and is consistent with the approach used for

decades in Canada and the USA. Although TB screening initiatives are not limited to port-of-entry, such schemes have formed the basis of both the UK's and London's screening programs. GPs and primary care facilities could play an important role in screening for TB amongst Londoners, both newly arrived and longstanding, but to date this approach has been extremely limited. A 2-year pilot project in Hackney demonstrated that screening at the GP level could enhance the detection and early treatment of TB (Griffiths et al 2007). However, despite showing promise and success, this has not yet been replicated elsewhere in the city.

Related to the issue of screening is that of identifying TB infection quickly once patients become ill or display symptoms of the disease. During this research numerous anecdotes were shared about patients waiting for months for a TB diagnosis from their GP, or even having to return to their country of origin in order to receive a diagnosis. Where once medical trainees were taught to always think of TB as a potential diagnosis when a patient presented with a baffling set of symptoms, this is no longer the case. Institutional memory and expertise regarding TB and its treatment is a casualty of once-declining TB rates and a lack of recognition within the medical community that the problem has returned to London. A respondent observed:

> *when I was training it was, when you had a differential diagnosis, TB was always one of the diseases, because it could cause symptoms in any part of the body. And so you always had TB as one of the options. Whereas now, most of them (medical trainees) haven't seen it, haven't been taught about it in their training and aren't aware.* (Former TB consultant)

Limited awareness of TB (both its symptoms and prevalence in London) amongst the medical profession has recently been acknowledged as a problem and the NHS has engaged the charity TB Alert to undertake a national educational campaign for healthcare professionals. The charity also works to raise awareness and reduce the stigma associated with the disease amongst many migrant communities with high incidence rates, encouraging potential TB patients to be tested for the disease.

Drug Resistant TB: A Serious and Growing Concern

Inadequate, incorrect, or incomplete treatment of TB also complicates TB control efforts. When patients do not finish their course of TB treatment, which typically takes six months, but can take up to 12 or even 18 months in complicated cases, or if they are prescribed an inappropriate or incorrect course of pharmacotherapy, risk of developing drug resistant TB increases. Full and appropriate treatment completion is

therefore essential. However, treatment completion has long been a challenge for those treating TB:

> *How could this happen in our developed nation in modern times when we know how to treat individuals with tuberculosis, when we know how to prevent the disease from developing in those infected, when we understand how drug resistance is acquired by the* tubercle bacillus *and how to prevent its emergence? Tuberculosis is back because we have ignored the lessons we learned years ago. Those lessons taught us that the only way to control tuberculosis was to ensure that those infected completed an effective course of therapy* (Dunlap & Bailey 1993:332-333).

Multi-drug resistant TB (MDRTB) is particularly serious because it is more lethal than mono or fully drug-sensitive TB. As discussed earlier, treatment for drug resistant TB is also significantly more expensive, typically lasting at least 18 months, and uses a more complicated and expensive pharmacological regime than does fully drug sensitive TB. Lengthy hospital stays also lead to higher in-patient costs. If TB is adequately managed and controlled amongst all segments of the patient population, MDRTB is not a problem. Consequently, MDRTB is interesting from an organisational perspective as it represents a failure of the TB control system (Nathanson et al 2010).

Perhaps not surprisingly, drug resistant TB rates have been increasing in London. By 2009 the rate of drug resistance rose to include 10% of all TB cases (Figure 9), exceeding by 33% the target (7%) set by the UK's Chief Medical Officer (Department of Health 2004). Most worrying is the three-fold increase in MDRTB, from 1% to 1.6% over the past ten years (see Figure 9). Amongst the one in ten TB cases in London with drug resistant TB, a history of UK imprisonment, homelessness and drug use are major predictors of this drug resistance (Health Protection Agency 2011[a]).

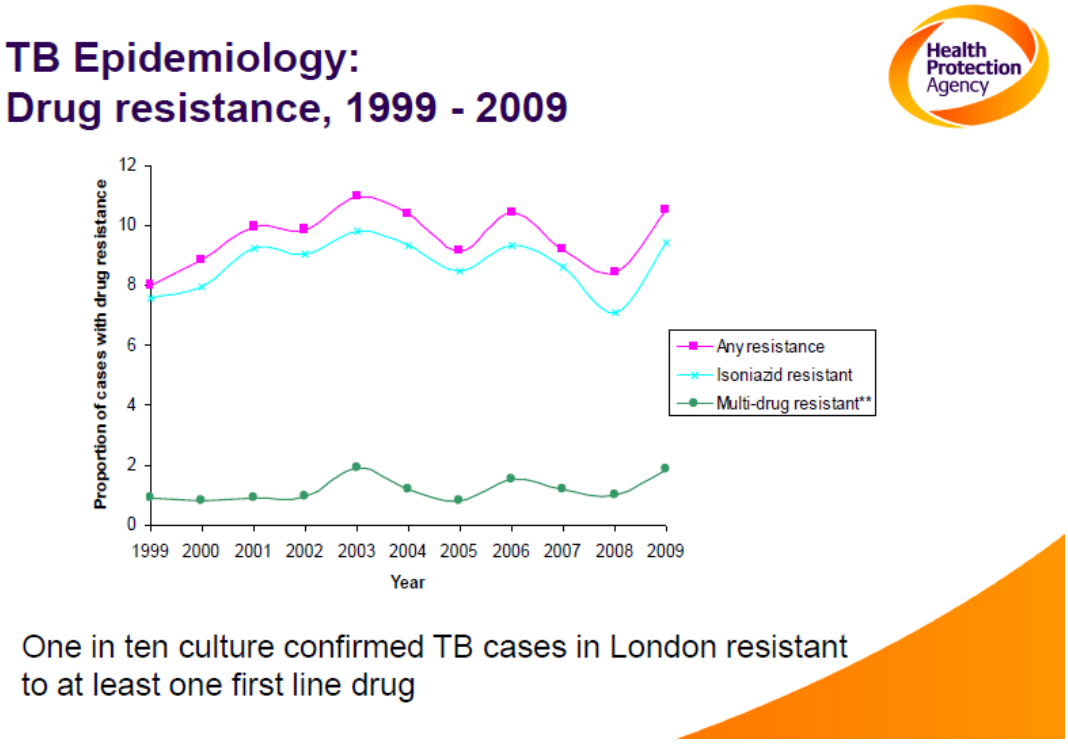


FIGURE 9: TB DRUG RESISTANCE IN LONDON (SOURCE: HEALTH PROTECTION AGENCY 2011B)

Since 2000, London has been battling an outbreak of isoniazid-resistant TB, with limited success. This outbreak was originally centred on a group of patients, many of whom had at been inmates at HMP Pentonville, but has since spread within London and to other parts of the UK. The inability of London's TB control system to bring this outbreak under control will be discussed in more detail in Chapter Six.

Concluding Remarks

This chapter has told the story of TB in London, providing a brief historical overview of the disease, but with a focus on the epidemiology of its recent resurgence and the broad organisational response to this epidemic. Some argue that TB in London is an "imported" problem, because most of the cases occur amongst migrants from Asia and Africa, inferring that lowering migration rates would reduce TB rates. The situation is not that clear cut, however, as most migrants are resident in the UK for more than five years before developing active TB disease. Furthermore, London faces challenges in managing the onward transmission of the disease within the country, agreeing protocols regarding screening and the prophylactic treatment of latent TB, and containing an alarming increase of drug resistant TB, much of which is found within a subpopulation of white, UK-born citizens. Increased global movement amongst citizens

between both high and low TB-incidence areas means controlling modern day TB is only partly related to controlling migration. For a myriad of reasons, 25 years after TB rates started to climb in London, the city continues to struggle with managing the resurgence of the disease. Notably, other major Western cities around the world have succeeded in bringing their resurgent TB under control.

The objective of this chapter was to provide the context for the empirical portion of this research and to set the stage for the reminder of the discussion. In the chapters which follow the literatures relevant to this thesis will be reviewed, starting in the next chapter with a critical review of the complexity theory literature.

CHAPTER THREE: Critical Review of the Complexity Theory Literature

Introduction

This thesis explores the extent to which complexity theory is useful as a tool for understanding the organisational response to resurgent tuberculosis across London compared to the longer established theories of professional dominance and New Public Management. In order to provide the academic context in which research questions were formulated and subsequently addressed (Murray 2011:124), the next two chapters review the literatures relevant for undertaking a complexity theory-based, organisational study on the system in London responsible for managing TB. This chapter critically reviews the complexity theory literature and the next chapter discusses literatures related to the professional dominance and New Public Management models, the secondary theoretical models used in this research.

The purpose of the "literature review" is to give "an account of the work that has gone before" (Murray 2011:124). More specifically, this chapter focuses on earlier complexity theory research and:

a) provides readers with a brief history and "primer" on complexity theory, mostly in relation to the social sciences, but extending to more general complexity theory concepts as required;
b) provides "an overview of the 'big issues'" (Murray 2011: 126) in complexity theory, including areas which are contested;
c) identifies gaps in the existing complexity theory literature to which this research responds;
d) discusses applications of complexity theory to healthcare; and,
e) discusses why certain complexity theory concepts have been used in this study

A Brief Historical Overview of Complexity Theory

Complexity theory is perhaps better thought of in the plural, as "complexity theories" (Burnes 2005:73) and most accurately conceptualised as a research program comprising insights from an array of social, natural and physical sciences. Rather than a unified and agreed upon theory (Lissack 1999) in the manner of structuration theory or the theory of relativity, for example, complexity theory is "an emerging approach or framework...a set of theoretical and conceptual tools; not a single theory to be adopted holistically" (Walby 2007:456). "Complexity theory does not render past paradigms obsolete. Instead it goes a step beyond these paradigms while remaining complementary to them" (Chiles et al 2004:501).

Fundamentally, complexity theory explores relationships "within and among systems" (Zimmerman 1999:69) and how these relationships give rise to collective behaviours, patterns, tendencies, and outcomes (Burton 2002:2, Manson 2001, MacIntosh and MacLean 1999, 2001, Levin 2002). In the case of complex systems, these behaviours and their resulting outcomes are conceived of as non-linear, unpredictable beyond the short term, and emergent in nature. For many complexity theorists, micro-level relationships are of more interest than events (Drazin & Sandelands 1992, Stacey et al 2000: 128, Stacey 2003: 237-238, 277-278, 281-283).

Whilst acknowledging significant differences in opinion and belief amongst researchers working within the complexity field, two definitions from a social science (rather than a pure or natural science) perspective provide useful and non-controversial descriptions of complexity theory and complex systems:

> *the interdisciplinary understanding of reality as composed of complex open systems with emergent properties and transformational potential. A crucial corollary of complexity theory is that knowledge is inherently local rather than universal. Complexity science is inherently dynamic. It is concerned with the description and explanation of change…* (Byrne 2005:97)

and

> *A complex system is a system (whole) comprised of numerous interacting entities (parts), each of which is behaving in its local context according to some rule(s), law(s) or force(s). In responding to their own particular local contexts, these individual parts can, despite acting in parallel without explicit inter-part coordination or communication, cause the system as a whole to display emergent patterns—orderly phenomena and properties—at the global or collective level* (Maguire & McKelvey 1999:26).

The roots of complexity theory are found in the pure sciences of mathematics and physics; specifically, in efforts starting in the late 1970's to understand weather patterns (Burnes 2005, Murray 1998), and with a 1980 research paper by physicist Hermann Haken which explored the concept of "self-organisation". This early work attracted the attention of other scientists, with Ilya Prigogine, a Belgian physical chemist, winning a Nobel Prize in 1977 for developing the complexity theory concept of "dissipative structures" which detailed how (non-human) systems dissipate useless energy (entropy) arising from self-organisation amongst constituent components, resulting in both transformation and order emerging within the system. Around the same time, researchers working in the natural sciences, especially ecologists and biologists, became interested in discovering how aspects of what eventually became known as complexity theory could help them solve puzzles within their fields, especially in relation to evolution and adaptation. Eigen (1971) concluded that physics-inspired laws of linearity and cause and effect could not explain the origins of life. Rather, he wrote,

> *What is required in order to solve such a problem of interplay between cause and effect is a theory of self-organization which can be applied to molecular systems…We may envisage that such a process of molecular self-organization includes many random events…What really matters is how certain such random effects are able to feed back to their origin…Under certain external conditions such a multiple interplay between cause and effect may build up to a macroscopic functional organization, which includes self-reproduction, selection and evolution to a level of sophistication where the system can escape the prerequisites of its origin and change the environment to its own advantage* (Eigen 1971: 467).

As will become evident later, Eigen draws upon the key aspects of what is now known as complexity theory – self-organisation, feedback loops and adaptation - in his efforts to understand how life began and how it evolves at the molecular level. Subsequently, Kaufman's (1993) *The Origins of Order: Self-Organisation and Selection in Evolution* continued this line of investigation, becoming a standard reference for much complexity theory research in organisation studies.

Social science, and management in particular, often borrow and adapt ideas and concepts from other disciplines. Early strategic management research relied heavily on work originating within War Studies (and still does), starting with *The Art of War*, written over 2000 years ago by Chinese military general and strategist, Sun Tzu. Operations management and management control theories draw heavily upon research from cybernetics (Otley 1995, Kirk 1995), as it was cybernetics which eventually gave

rise to systems theory, including soft systems theory.[1] Organisation theorists and strategists have frequently called upon Darwin's "survival of the fittest" and theories of evolution to explain organisation ecology, change and fitness (Pascale 1999, Levinthal 1997, White et al 1997, McKelvey 1997). Likewise, economics borrows extensively from research by psychologists (Camerer et al 1997, DeBondt & Thaler 1985, Kahneman & Tversky 1979), and for over a century it has drawn upon the work of biologists (Witt 2006), with a journal, *The Journal of Evolutionary Economics*, devoted to the inter-disciplinary field (including a 2006 special issue dedicated to studying the intersection between evolutionary theories and economics).

The interest in complexity theory within management studies, especially organisation theory and strategic management, arose from dissatisfaction with the reductionist, Newtonian-inspired approach to interpreting organisations and a sense that this method had become inadequate and outdated (Stacey et al 2000: 3-9, Tsoukas 1998, Macguire & McKelvey 1999, Leifer 1989, Plsek & Greenhalgh 2001). The term "Newtonian" is generally taken to apply "to everything that dealt with a system of laws and with equilibrium", and in organisation theory, for instance, gave rise to the "machine age" and Weber's ideal form, bureaucracy, a desire to determine underlying rules of order and a quest for control (Leifer 1989:901). However, such positivist, functionalist approaches to studying complex organisations seem insufficient to advance knowledge in today's globally inter-connected and complex world (Andriani, 2001, Bettis and Prahalad, 1995, Godfrey & Hill, 1995, Stacey, 1995, Urry, 2005, Wicks & Freeman, 1998). They lack the capacity to address paradox, a key aspect of modern organisations, leading to puzzles such as why managers, who are paid "to be in charge... find it difficult to stay in control...and (why they) sense the importance of difference but experience the pressure to conform" (Stacey et al 2000:5). Also, traditional approaches have often produced unsatisfactory models and explanations of organisational change "with many studies reporting a very high failure rate, sometimes 80%" (Burnes 2005:73).

The unsuitability of positivism and functionalism in relation to this research will be discussed in greater detail in Chapter Five, but a sense has emerged that researchers need theories which are complex enough to accommodate, amongst other things, an organisation's history, politics, context and novelty (Emirbayer 1997, Burnes 2005). Identifying cause and effect relationships within organisations has always been

[1] WR Ashby, the "father" of cybernetics is also responsible for the "law of requisite" variety, a concept which became important in complexity theory, as will be discussed below.

difficult, but it has been made more so by the emergence of modern, lateral organising forms, many of which comprise multiple components that are often geographically dispersed, functionally diverse, and which are themselves often dynamic, independent organisations. Chief among these organising forms are networks, both geographic and (increasingly) virtual, for example, Silicone Valley and eBay, respectively (Andriani 2001). Nonetheless, the impact of Newtonian thinking has been profound. Its unflinching belief in the powers of equilibrium and control underpin the predominant perception that systems and organisations exist naturally in a state of equilibrium and that through strategic planning and effective management practices, one may exercise control over these systems (Dooley et al 1995). The dominance of the Newtonian paradigm is also seen in the ongoing reliance in public management research on statistical methods of analyses developed before the turn of the 20th century (Weber 2005).

The standard logico-scientific approach has undeniably served the physical and natural sciences well, in part because research in these fields often focuses on closed, controllable systems. However, for the behaviours of the open, complex systems which characterise the world of human organisations, replete as they are with actors' free will and perceptions, the logico-scientific approach falls short as a tool of description and explanation (Stacey et al 2000:3-9, Tsoukas & Hatch, 2001). Indeed, this need to support nuanced and complex description and explanation underlies the persistent interest by social scientists in using complexity theory. Despite the challenges inherent in transposing complexity theory from the physical and natural sciences onto a social science platform, social scientists persist in seeking new models and means of understanding the increasingly complex social and organisational world.

The Complexity Theory Research Program

Arguably, interest in complexity theory in the study and practice of management was ignited with the introduction of the phrase "edge of chaos", to describe a precarious and challenging organisational state from which often complex behaviours and novel outputs were theorised to emerge. "Edge of chaos" organisations are in a state far from equilibrium, but somehow survive, seemingly in contravention of Newtonian science. The phrase itself emerged in the mid-late 90s (MacIntosh et al, 2006:128), in the context of a recently ended economic recession, and rapid rates of globalisation and technological developments. Overall, it was an era when change was occurring at a pace previously unknown to managers and management researchers. The term resonated

both in business schools and in practice, subsequently capturing a place in the management lexicon and promoting further research in the field.

There is now a significant and varied body of complexity theory literature relevant to the social sciences: from a mathematical or modelling perspective (Goldspink 2002, Holland, 1992, Moldoveanu & Bauer, 2004, Agar 2002, Leykum et al 2007); through the paradigm of chaos theory (Levy, 1994, Thiétart & Forgues, 1995); or from views rooted in quantum mechanics (McKelvey 2003, Gell-Mann 1994). Specific to organisation studies, a community of researchers is producing a growing body of literature applying complexity theory to an array of organisational issues, with a journal, *Emergence: Complexity & Organization (E:CO),* devoted to the study and application of complexity theory in organisations. Special issues on complexity theory have been published by the journals *Organization* (1999), *Journal of Organization Change Management* (2000, 2002)*, Journal of Social Issues* (2001), *Public Administration Quarterly* (2005), *Public Management Review* (2008) and *Social Science and Medicine* (2012). Other disciplines within the field of general management studies have also shown interest including: strategic management (Eisenhardt & Brown 1998, Axelrod & Cohen 2000, Pascale et al 2000, Rivkin 2000, Robson et al 2008, Boisot 2003, Boisot & Child 1999, Katsikias & Bello 2008, Stacey 1995); leadership (Hazy et al 2007, Wheatley 1992, 1999); change management (Beinhocker 1999, Glenn & Malott 2004, Houchin & MacLean 2005, MacIntosh & MacLean 1999, 2001, Styhre 2002); management consulting (Griffin et al 1998); technology development (Brown & Eisenhardt 1997); organisational learning (Sterman 1994, Espejo 2003); and, organisational culture (Frank & Fahrbach 1999).

Public management researchers came to complexity theory research later than their counterparts in both general management studies and healthcare studies. A Google Scholar title search using the search terms "public management", "public sector", "public administration" AND "complexity theory" yielded no results for the years leading up to 1999, although there were five pertinent publications identified which did not use the term "complexity theory" in their titles[2]. A further Google Scholar search in

[2] These were: Wright C, Shevchuk L (1994), "Knowledge, chaos and public policy", *Realistic Evaluation*; Koehler GA (1997), *What Disaster Response Management Can Learn from Chaos Theory: Conference Proceedings*, Demchak CC (1995), "Complex Adaptive Systems, Chaos, and Contemporary Policymaking", *Policy Studies Journal*; Morçöl G (1997), "A Meno Paradox for Public Administration: Have We Acquired a Radically New Knowledge from the 'New Sciences'?, *Administrative Theory & Praxis;* and, Newell WH, Meek JW (1997), "What Can Public Administration Learn from Complex System Theory?", *Administrative Theory & Praxis*

which these search terms were not limited to the title field yielded 281 results (including the five cited above), the vast majority of which were either irrelevant (i.e., the term "complexity theory" was mentioned at some point in the text) or had only a minor focus on complexity theory. By contrast a similar search on Google Scholar using the terms "management", "organization" AND "complexity theory" yielded 3250 results. From 2000 onward, however, interest by public management scholars in complexity theory started to grow, and since the mid-2000s a steady and growing stream of research has emerged.

Some of this research has been valuable in informing this thesis. Houchin and MacLean (2005) apply four complexity theory precepts at an organisational level within a public sector setting and conclude that organisations may not be naturally complex adaptive systems, but rather may tend toward order and hierarchy, in order to reduce anxiety levels. Undertaken in the UK, in a strong NPM context, it studies the change arising from the introduction of a newly devolved "quango". Rhodes and McKechnie (2003) argue complexity theory is a useful analytic tool for responding to NPM-inspired complexity (citing the emergence of networks as one response to this complexity) within public services systems. Their longitudinal, processual, case study at the system level (the public housing system in Dublin) illustrates how NPM concepts such as managerialism, privatisation and decentralisation can be understood with a complexity theory framework, highlighting the importance of adaptation by agents within a system. Crucially, they suggest researchers "look for the ways in which public service systems are creating 'order'...and how this affects...overall performance" (p.79). Boons et al (2009) and Rhodes et al (2011) offer useful theoretical guidance for researchers using complexity theory within public management research. They emphasize the importance of acknowledging the broader environmental context in which public management-complexity theory research is undertaken (Rhodes 2011) and note how the status-quo can be reinforced via self-organising behaviours within the public sector (Boons et al 2009).

There is also a significant body of complexity theory research within healthcare, reviewed below. However, despite the varied and growing body of complexity theory research, many of the puzzles and promise which originally motivated scholars in this "ultimate interdisciplinary science" remain (McKelvey 1997:371).

The Appeal of Complexity Theory

In spite of limitations, organisation theorists and managers have traditionally tried to control systems and processes by relying on relevant laws of cause and effect within the dominant organisational science paradigm (Donaldson 1985, Dooley 1995). Although experience suggests that their ability to predict outcomes is limited, there remains a real human need to find patterns and certainty (Proulx & Heine 2008). By identifying what *causes* something to happen, people want to *predict* and *control* what happens. Complexity theorists often also try to identify causal structures and mechanisms within organisations. However, they do not hold the view that causality is linear or predictable, and focus on identifying systems' "general tendencies" instead of isolating rigid laws of cause and effect (Danermark et al 2002:74).

Another explanation for the appeal of complexity theory lies in social sciences' search for credibility and recognition by drawing on "real" sciences (Byrne 1995). Rooted in the pure and natural sciences, "complexity science" as it was commonly referred to in the 1980s and 1990s, was seen as having the potential to bring some long-sought authority to social science research and perhaps also respect from other researchers. In addition, the ease with which some complexity theory concepts can be applied, metaphorically at least, to organisational and social systems adds to the appeal. Common parlance, for example, often conflates the idea of self-directed and empowered teams with the concept of self-organisation; and the popular management books and articles which enthusiastically embraced the complexity theory term "edge of chaos" often display little understanding of its original meaning and origins.

Whilst some have suggested that the rising interest in complexity theory corresponds with the fall of Newtonian-style thinking, others posit this is a "straw argument" maintaining that organisation theorists had abandoned a purely mechanistic view of organisations long ago and that the real question for organisation theorists is whether organisations are systems or not (MacIntosh et al 2006:116,123-124). While an interesting issue, it is beyond the scope of this research which takes the position that organisations are indeed systems, usually complex systems.

Complexity Theory and Healthcare

Complexity theory has established a significant presence in healthcare research as healthcare systems are widely regarded as complex systems (Anderson et al 2005, Axelrod & Cohen 2000:75-77, 83-84, Begun et al 2005, Byrne 1998:105-120, Curtis &

Riva 2009, Plsek 2001:309-321, Sweeney & Griffiths 2002, Trochim 2006). Understanding how promoting complex organisational behaviours can enhance healthcare innovation, safety, quality, effectiveness and reform are of particular interest (Arndt & Bigelow, 2000, Anderson 2003, Glouberman & Zimmerman, 2002, Leykum, et al, 2007, Plsek & Wilson 2001, Sarra 2005, Simmons 2003, Zimmerman, 1999). In contrast to traditional models, such as New Public Management and professional dominance, used to explain healthcare organisations, complexity theory places emphasis on understanding micro-level relationships (Drazin & Sandelands, 1992), since "health care depends largely on productive interaction" (Plsek & Wilson 2001:746). Further, complexity theory assumes systems are considerably less linear and rational when compared with the intellectual groundings of NPM and professional dominance models.

Related to this is complexity theory's capacity to acknowledge and accommodate the role played by anxiety within an organisation, by viewing it as a source, or cause, of disequilibrium (Houchin & MacLean 2005). Complexity theorists have also noted that anxiety often manifests as an apparent resistance to change and innovation (Plsek & Wilson 2001, Plsek 2001), an oft-cited challenge by healthcare reformers. The complexity theory perspective on patient safety and care quality issues is particularly relevant. Whereas the traditional medical system views patient safety as stemming from the individual healthcare professional's responsibility to "do no harm", complexity theory sees safety as a system property (Plsek & Wilson 2001). The authors note that healthcare leaders should promote the development of systems which both reduce variation (e.g. ensure physicians always prescribe aspirin following heart attacks) and have space for innovations to emerge, including recognising unexpected instances of positive variations arising from routine processes (also known as "positive deviance"). In contrast to mechanical systems (airplanes) which are characterised by predictability, complex adaptive systems (healthcare systems) have the potential to produce emergent novelty and innovation, although "(s)uch behavior can be for better or for worse; that is, it can manifest itself as either innovation or error" (Plsek 2001:310).

Amongst the best known complexity theory researchers in healthcare are Plsek and Greenhalgh, who edited (and contributed to) a series of four papers on complexity theory and healthcare in the *British Medical Journal* in 2001. The papers emphasised the need for medicine to move away from strictly linear, cause and effect thinking and to embrace unpredictably, the need for flexibility, the role of the unknown, and the

importance of holism and relationships in clinical practice (Plsek & Greenhalgh 2001). In addition, Plsek (2001) wrote a short, but well cited appendix, "Redesigning Health Care with Insights from the Science of Complex Adaptive Systems", to the influential American book *Crossing the Quality Chasm*, which presents a clear and compelling case supporting complexity theory's value in bringing change and improvement to healthcare.

Within healthcare, complexity theorists have shown particular interest in primary care. Griffiths (2002) argues that complexity theory is well placed to inform and improve primary care research because it accounts for interaction, feedback loops, history and environment (physical, psychological, social) – all important aspects of a general practice consultation. Complexity theory offers clinicians a means of making sense of the everyday paradoxes of general practice through "its focus on multiple interactions and context rather than on single cause-effect mechanisms" (Litaker et al, 2006:S33). A large-scale quantitative, logarithmic study of consultation patterns in primary care, concluded "the complex system, comprising patients and their primary healthcare providers, itself strongly influences its own consultation rates", and cautions against the uninformed use of "reductive performance measures" when planning primary care reform (Love and Burton, 2005:352).

Finally, and of particular significance for this research, complexity theory recognizes "the recursive and dynamic connections between population health, health policy and health care" (Curtis and Riva 2009:519). Or, with specific regard to the study of epidemics, such as resurgent TB in London, "research cannot do without an integrated view of the complex system of determinants as well as the methods and techniques of nonlinear dynamics[3]" (Philippe & Mansi 1998:604). However, despite significant scholarly interest within healthcare management, as within the broader social sciences, there remains a significant shortage of complexity theory informed empirical research, including at the system level, the level at which this research has been undertaken. This will be discussed in more detail, toward the end of this chapter.

So complexity theory is a highly diverse field of study. This research, as with most existing research in the field, will necessarily focus on selected aspects of the theory (MacIntosh & MacLean 2001) potentially relevant to the subject of study – London's TB control system – and those which could be observed within the time and resource

[3] The term "nonlinear dynamics" was sometimes used in earlier complexity theory research synonymously with "complexity theory".

constraints of PhD research. The section which follows presents a general overview of the widely accepted features of complex systems, as derived from a broad reading of complexity theory literature within the social sciences, especially healthcare and organisation theory, and more limited reading from within the pure and natural sciences. These features are relevant to this research and form the basis for the theoretical discussions which follow later in Chapters Eight and Nine. As mentioned earlier, debates continue about exactly what constitutes complexity theory and complex systems. Nonetheless, there is broad agreement amongst scholars on the importance of a number of concepts within the field, and five of these ideas are discussed below, starting with a rather detailed discussion on self-organisation and emergence, the two basic building blocks of complexity theory.

Generally Agreed Features of Complex Systems

1. Self-Organisation and Emergence

The concept of self-organisation is fundamental to complexity theory, and is "at the core of the difference those speaking of complexity are trying to draw attention to" (MacIntosh et al 2006:289). Self-organisation is the singular, defining feature of the complexity program of research. However, as with most aspects of complexity theory, the "hows and whys" of self-organisation remain contested. Complexity theorists debate how self-organisation occurs, how self-organised systems function and the impact of these self-organising systems on the broader systems of which they are parts.

"Emergence" is the other concept considered vital to the complexity theory framework. Self-organisation leads to the emergence of unpredictable behaviours, outputs, outcomes, innovations, or novel responses (Arndt & Bigelow 2000, Fuller & Moran 2001, Lissak 1999, Reitsma 2003, Stacey 1995, Goldstein 2000, Stacey 2000: 8, 106-123). "Emergence is the process that creates new order together with self-organisation", and "in a human system tends to create irreversible structures or ideas, relationship and organisational forms which become part of the history" (Mitleton-Kelly 2003:21). Emergent outputs are "irreducible to (their) underlying components and cannot be predicted linearly by considering the sum of the parts that constitute its underlying blocks" (Philipe & Mansi 1998:595). In other words, the sum of an emergent output is greater than its parts. Some authors (Goldstein 1999, 2000), however, downplay the role of unpredictability within emergence, claiming much of what emerges from self-organisation actually is predictable, albeit within fairly broad

parameters. As well, self-organisation does not invariably result in emergent outputs; systems can self-organise without producing novelty (Serugendo et al 2006).

In the section below self-organisation and emergence are discussed in tandem, as disentangling them conceptually is difficult and would needlessly complicate the discussion.

Self-organisation is concerned with the creation of internal order within a system or sub-system, often in response to perturbations in the external environment. Rhodes & McKechnie (2003:79) define order as "a stable pattern of relationships among elements of the system", a useful perspective for this research. One of the pioneering scholars in the study of self-organisation, physicist Hermann Haken, wrote in the landmark 1980 paper "Synergetics":

> *On the macroscopic level collective modes appear which define the order of the total system. The quantities describing these collective modes are called order parameters. Such order parameters can be material, such as the amplitude of a physical wave, but equally well immaterial, such as ideas or symbols describing certain configurations (modes). On the other hand once these order parameters are established they prescribe the actions of the subsystems...* (Haken 1980:123).

The "order parameters" described by Haken are dynamic and iterative, changing the system of which they are a part while also being changed by the system. The result is a form of stability brought to the system by the "order parameters".

Discussing Haken's work some 30 years later, Goldstein et al (2010:88), highlight the "constraints that are placed on the system" from its external environment as it self-organises. This observation is consistent with Stacey's (1996:179-182) description of the importance of "control parameters" in self-organising systems, as discussed more below. More generally it supports the argument that the *context* in which complex systems exist, and where self-organisation occurs, is fundamental to understanding the behaviour of the system and to applying a complexity theory framework. This is another key aspect of this research which will be discussed in more detail.

"Self-organization is the process by which agents in a system interact with each other according to their own local rules of behaviour without any overall blueprint telling them what they are to accomplish or how they are to do it" (Stacey, 1996:290). A

complex, self-organising system has "little or nothing in the way of a central control" (Holland 1992). In other words, there is no "big plan" (Begun et al 2003:280). Or, "(t)here is control, but no one is 'in control'" (Stacey. 1996:204). Paley (2011) claims that actors in self-organising systems also lack a conscious intention or motivation to organise in a certain manner, a fact which he argues is sorely overlooked by most complexity theory researchers. Paley's constitutes the most "conservative" definition of self-organisation.

Stacey also stresses the importance of self-organisation in establishing "the overall pattern of relationships that is organising itself at the same time as the nature of the agents is changing" (2003:333). This emphasis on the relationship between self-organisation and the emergence of patterns is echoed by others: "(s)elf-organisation, emergence and the creation of new order are three of the key characteristics of complex systems" (Mitleton-Kelly 2003:19). Goldstein (2000:14) discusses emergence and self-organisation and refers to "a pattern that exhibits a type of coherence not found among the interactional agents alone." McKelvey concurs:

> *Management writers mostly emphasize chaos and complexity theories as a means of better understanding the behavior of firms facing uncertain, nonlinear, rapidly changing environments... This view is somewhat off the track...Going back to the roots of complexity science in Prigogine's work, we see more accurately that complexity science is fundamentally aimed at explaining order creation (McKelvey 2003:6)*

Public management researchers adopt a slightly different perspective, defining self-organisation as "the ability of actors and organizations as well as larger systems to maintain or change their structure and strategy by themselves, without external control, and to resist externally induced change." (Boons et al 2009:234-235, emphasis added). Furthermore:

1. *Self organisation is a driving force of governance processes that sheds light on why governmental steering ambitions often fail.*
2. *Self organisation causes processes to follow unanticipated trajectories. Self organisation stems from the free choices of people in charge often oriented at maintaining their position and stability, but occasionally oriented at change and adjustment to new demands or circumstances.*
3. *Self organisation can and often will be driven by the ambition or need to survive (often this is called self-interest...), but also by the ambition to contribute to and have an impact on a larger system (often this is called public interest...). (*Boons et al 2009: 235-236)

Public management scholarship in complexity theory lacks the rosier view often presented in both general management and healthcare research. That systems might self-organise to resist change or maintain current structures is a notion which receives scant attention in the general management literature and may be a reflection of the professional experiences and biases of public management scholars. However, it is related to another complexity theory concept which receives slightly more attention in the broader literature, namely the concept that systems do not always self-organise to positive effect or with beneficial outcomes. Self-organisation, or what McKelvey (2003:10) refers to as "entanglement", can produce "compromised...fragile...or maladaptive" results for an organisation and "the creation of efficacious emergent complexity" is not assured by the mere existence of self-organisation. As he notes, this argument was largely lost in management research, and indeed in much of the complexity theory research within the broader social sciences.

Similarly:

> *Amid all the hoopla surrounding self-organization and emergence, it is often assumed that they are necessarily a good thing, that systems exhibiting them are significantly better off, or, at least, that something problematic in these systems is markedly ameliorated. To be sure, the tendency to emphasize the beneficial nature of emergence seems to be a taken-for-granted attitude in complexity science.... A similar bias for believing that self- organization and emergence are nothing but advantageous for a complex system can also be seen in organizational applications* (Goldstein 2000:18).

The former Yugoslavia self-organised along the lines of ongoing ethnic tensions, with outcomes "fraught with emergent political structures" that are far from positive (Goldstein 2000:19).

Three additional, often overlooked, features of self-organisation include:

- Outcomes are co-created by all agents within a system. Everything everyone does, including doing nothing, might have an impact.
- There is no requirement for democracy or consensus within self-organising systems, but the tension between co-operation and competition is important.
- There is no requirement for empowerment of lower-ranking members for systems to self-organise, nor for more powerful members to lose their power (Stacey 2003: 333).

Why and How Self-Organisation Occurs

Scholars believe self-organisation is a response to a system finding itself far from equilibrium, usually arising from an external perturbation or some other source of instability. As Dooley (1997:87) explains, "(i)t is at these far-from-equilibrium conditions that complex systems can spontaneously evolve new and more complex structures of order. The system does so through self-organization..." This lies at the heart of Prigogine's Nobel Prize winning concept of "dissipative structures" mentioned earlier: that systems "may pass through states of instability and reach critical bifurcation points where they spontaneously self-organize to produce a different structure or behaviour that cannot be predicted from a knowledge of the previous state" (Burnes 2005:78).

The concept of dissipative structures calls into question whether an organisation or system can actually exist at the (in)famous "edge of chaos". No scholarly agreement exists on whether such a state exists, despite the phrase's success in capturing the imaginations of many. Moreover, "at the edge of chaos" implies that a firm is "hanging about" in that state, and that it is possible, and desirable, to stay poised between a state of equilibrium and disequilibrium (MacIntosh et al, 2006:128). Some argue that organisations such as Toyota and GE keep themselves in such a state by fostering high performance – and high anxiety - work environments. In their own research, MacIntosh and MacLean (1999), and Leifer before them (1989), adopt a view closer to that of Prigogine, arguing that both equilibrium and disequilibrium can exist within organisations and that organisations bifurcate, or switch, between the two states, in a sort of "punctuated equilibrium", to borrow a term from evolutionary biology. It is during this bifurcation phase that complex and innovative behaviours can emerge. But MacIntosh and MacLean (1999) argue that hovering "at the edge of chaos", between equilibrium and disequilibrium, is not possible or desirable beyond the very short term (MacIntosh et al 2006:128-129). In practical terms this is significant as the actions required to keep an organisation "at the edge of chaos" are presumably different and of longer duration than those required to provoke a state of disequilibrium, and then waiting to reap the potential benefits of any self-organised response.

Whilst the manner in which self-organisation and emergence occur is of great interest and debate, it is agreed that self-organisation occurs locally, at the micro level, and the resulting micro-level structures give rise to meso and macro level order (Chiles 2004). *How* systems self-organise varies, but self-organisation is important as it is often

regarded as the source of causality – good or bad - within organisations (Stacey et al 2000:127-129).

Self-organisation may also contribute to the roles and relative importance of exploration versus exploitation within systems; specifically, systems' ability to find an appropriate balance between "exploitation" (doing more of what it does well) and "exploration" (trying, discovering, or creating – e.g. innovating) (Holland 1992, Axelrod & Cohen 2000:43-45). Finally, and crucially, self-organisation is believed to occur in the absence of a single, formal leader (Drazin & Sandelands 1992), although this does not necessarily mean an absence of accountability for the performance of the organisation/system (Houchin & MacLean 2005, Holland 1992).

Some authors argue that successful self-organising requires the "right" number of ties, information flow and informal connections amongst members of the system: too few ties and the system becomes moribund/overly stable; too many ties and it becomes chaotic (Begun et al 2003, Stacey 1996:180-181). Other scholars believe that that it is the intensity of the ties which matters (Axelrod & Cohen 2000), or that the strength or weakness of these ties is of less importance than their absolute number (Stacey 1996). Still others argue that it is the combination of factors that matters, that the right number of the right kind of ties, along with the right type and amount of tension within the system are necessary if self-organisation is to result in positive emergence and innovation (McKelvey 2003). Feedback loops, particularly positive feedback loops which introduce new elements or schema into already unstable systems, are another important source of iterative changes and adaptations within self-organising systems (Arndt & Bigelow 2000, Levin 2002, Tsoukas 1998). Positive feedback loops can lead to increased diversity or variety within a system (Leifer 1989), whilst also providing capacity for the system to manage more diversity. (Negative feedback loops, on the other hand, are concerned with returning a system to, or maintaining, its original state of equilibrium, such as a thermostat in a heating system.)

Some researchers speculate that self-organisation may occur by means of the relentless application of a small number of rigorously followed, simple, non-negotiable rules within a network of agents (Holland 1992, Brown & Eisenhardt 1997, Drazin & Sandelands 1992, Rhodes & McKechnie 2003, MacInitosh et al 2007, Phelan 1999). However, not all complexity theory researchers accept this, viewing self-organising behaviours more loosely, as manifesting in patterns, tendencies, or order, but not

reducible to rules (Zimmerman 1999, Cilliers 1998:107). Indeed the underlying logic of the "simple rules" argument is reductionist at its core and contrary to the views of complexity researchers who believe that complex systems and behaviours are ultimately non-reducible to their constituent parts (the view espoused by this research). These two "competing" schools will be discussed later in this chapter.

Boundaries and Parameters of Control in Self-Organising Systems

Within self-organising systems there are parameters which dictate how agents behave. Stacey (1996:204) argues that human nature is such that people want to "belong", so they act in ways that ensure their continued membership in the self-organising group. This behavioural constraint does not come from an individual within the group, but rather from the group itself. This aspect of self-organisation results in much of the stability seen in organisations, and prevents self-organising systems becoming anarchic, with individual agents doing what they please; in other words, "(t)he system and its agents are emerging together, simultaneously constraining and being constrained by each other" (Stacey 2003:333). These constraints can include, for example, resource allocations, operating procedures, hierarchical structures, conferred legitimacy from the top, and vision and mission statements (Stacey 2003: 334).

Agents in self-organising systems respond to others "according to their own capacity to respond", including all of the enablers and constraints which result from each individual's base of organisational knowledge, understanding and power (Stacey 2003: 333). This means that agents interact, i.e., form ties, with greater or lesser numbers of other agents and with those at greater or lesser distance. For example, if a CEO gives an order and all employees respond by following the same plan of action, there is no self-organisation. But if agents in a system "responded according to their own local capacities, and their responses had some effect on the CEO, leading to further responses from the CEO, then this would be self-organisation". This demonstrates that reflexivity and iterative change are important aspects of self-organising systems (Stacey 2003:334). This reflexive interaction between actors and organisational constraints is partly why it is so difficult to predict organisational outcomes beyond the short-term. It is impossible to know where or how this dialectic will end as all agents are changing, and being changed by, the dialogue (Stacey 2003:335).

The emergent outcomes, both good and bad, ultimately wrought by self-organisation occur when an organisation is in a state of disequilibrium, either existing at the "edge of chaos" or immediately after an organisation reaches a critical bifurcation point. As

mentioned earlier, reaching this point requires that the various "control parameters" within the system, or organisation, undergo some form of change or alteration, the most significant of which occur within the organisation's "shadow" system, or via its grapevine. These control parameters include:

- The rate of information flow
    - If the information flow is fast, it is more difficult for the organisation to keep information flow within the legitimate organisation and it starts flowing through the shadow organisation, or grapevine. At some point the information flow becomes too heavy even for this system to manage and the organisation tips "into the unstable zone".
- The degree of diversity
    - Somewhere between anarchy and excessive conformity, an organisation "has enough diversity to provoke learning".
- The richness of connectivity (or the nature and number of "ties" within the organisation)
    - As noted earlier, "few connections bring stability and many bring instability". Strong emotional ties amongst members of a system may lead to increased confidence, less anxiety and more openness to change than would be the case if the system were characterised by high anxiety. On the other hand, where ties are weak, there may be more contact with other parts of the broader system, leading to more variety being "imported". This, however, may lead to instability and/or "too much variety for effective learning". At some point, between weak and strong, many and few ties, "the network is likely to produce great variety in behaviour".
- The level of contained anxiety
    - If a system is characterised by too much anxiety, creative work is not possible. If there is too little tension, however, people "resist change in a very effective manner". If a system is part of a broader organisation or society, which is "punishing, insecure, or highly pressurised" the system will respond by creating "anxiety-containing structures at the expense of organizational creativity".
- The degree of power differentials
    - In a system where power is concentrated at the top, the shadow system is relatively inactive and the system is stable. If power is equally

> distributed across a system, however, there may be a power vacuum which can throw the shadow system, and the broader organisation, into disarray. It is theorised that in between these two states is where creativity happens (Stacey 1996: 179-182).

Research into self-organisation has evolved since the early 1990s when complexity theory in management studies first gained prominence. For instance, it had become commonplace to equate self-organisation with the absence of hierarchy or any manner of a command and control structure, with arguments that such a "laissez-faire" approach was a prerequisite for the emergence of innovation or novelty (Goldstein et al 2010:4). Scholars, especially those writing in the last decade, are more likely now to criticise such an approach as "facile":

> *Rigorous complexity science research has borne out the opposite conclusion, namely, that any positive result from the emergence of innovation requires both bottom-up and top-down influences from proactive leadership events. In contrast, tearing down hierarchical structures can easily lead to a morass of unanticipated outcomes, many of which are much worse than what existed before* (Goldstein et al 2010: 4-5).

This observation will be shown to be of particular relevance to this research.

2. Non-linearity

Complexity theorists are interested in identifying and understanding the unpredictable, often non-linear, responses to instability or change exhibited by systems and which cannot be explained with Newtonian cause and effect theory. Non-linearity is often responsible for novel, emergent outcomes, because in the presence of purely linear cause and effect behaviours there can be no unpredictable outcomes. Within a complex system, non-linear outcomes arise "because each component interacts with others via a web of feedback loops" (Grobman 2005:358). Consequently, small degrees of turbulence can produce an unexpectedly large impact, while large disturbances may be barely felt (Arndt & Bigelow, 2000, Chiles 1994, Cooksey 2001, Holland 1992, Manson 2001, Plsek 2001, Sarra 2005, Tsoukas & Hatch, 2001, Tsoukas, 1998). Within the field of epidemiology an example can be seen with the introduction of crack cocaine into the street heroin market and how it unexpectedly changed the nature of the drug using population, the pattern of street drug use, and the entire dynamic of the illicit market for heroin (Agar 1999). (Incidentally, some clinicians interviewed for this research believe crack cocaine also increased TB rates in London by increasing the homeless population and the number of people with compromised immune systems.) In

organisation theory and within the healthcare sector in particular, an example of non-linearity can be found in the massive amount of public resources routinely invested in various healthcare reform initiatives with seemingly little apparent improvement or change (Plsek 2001).

3. Co-evolution and Co-adaptation

Complex systems co-adapt as part of the order creation function inherent in self-organisation. Adaptation is defined as "the changes made by agents in response to the actions of other participants, environmental conditions or emergent system characteristics" (Rhodes et al 2011:14). Co-adaptation is important because it increases system fitness: if organisations succumb to their natural temptation to decrease or resist change, thereby reinforcing a state of equilibrium, they will become increasingly misaligned with their environment, unable to cope with the next inevitable round of change, and will eventually decline (Leifer 1989). Inherent in the concept of co-adaptation is the idea that "systems change their rules of interaction...without (necessarily) knowing what the system as a whole is doing"; therefore co-adaption can be "self-repairing and self-maintaining", (Mitleton-Kelly 2003:6). Mutual adaptation can be "conflictual as well as more harmonious", an aspect often overlooked (Walby, 2007:463).

"Evolution" and "adaptation" are both concepts rooted firmly in the sciences of biology and ecology, and both phenomena can only occur within ecosystems. Consequently, the nature of the ecosystem of which a complex system is a part is key to potential co-evolution and adaption (Mitleton-Kelley 2003). Within an ecosystem all entities are interdependent and the ecosystem "provides sustenance and support for life...When firms and institutions cease to function like a community or social ecosystem, they may break down. Some of the most successful organisations nurture their community or social ecosystem" (Mitleton-Kelly 2003:9-10). Interdependence is a relevant concept to this research as the interdependence of sub-systems within the broader TB control system in London is not obvious.

Elements within a system, as well as the system itself, can co-evolve, with a distinction between "co-evolution *with*" and "adaption *to* a changing environment" (Mitleton-Kelly 2003:7). Co-evolution happens over the longer-term, whilst adaptation within or between systems can occur more quickly. In an organisational context, the rate at which co-evolution occurs is of interest because of its applicability to knowledge

transfer and the sharing of best practice. These concepts will be expanded upon in later chapters.

4. History, Sensitivity to Initial Conditions and Environmental Context

Complexity theory is greatly concerned with history, because of the importance it places on the role of evolution in systems, particularly in natural or physical systems (Mitleton-Kelly 2003). An organisation's history is not only an irreversible reality, but the system's initial conditions, as determined by this history, are responsible for the system's current and future behaviours and outputs. "(O)ur *previous* inter-actions have brought about what we *currently* experience", observed Tsoukas (1998:302). A system's history also "shapes individual and organizational schema (mental models, or "world-view") and schema in turn constrain what is seen and not seen, what is important and what is not" (Zimmerman & Dooley 2002:70). Further, understanding how a system reached its current state "is required in order to specify possible future states" (Rhodes & McKechnie 2003:79), albeit within the confines of complexity theory's conviction that organisational futures are largely unknown or unknowable. However, whilst "(h)istory is highly relevant, (it is) not necessarily deterministic", allowing for the emergence of novelty or other unpredictable organisational outcomes (Begun et al 2003:264). In practical terms, the outcomes produced by a system may be less a reflection of chance or serendipity and more a manifestation of a series of decisions taken in the past, including decisions to maintain the status quo. "(B)ut before the decision is finalised, the alternatives are sources of innovation" (Mitleton-Kelly 2003:13).

Recognising a system's initial conditions at the outset is an important component of complexity theory research (Agar 1999, 2002, Byrne 2005, Cooksey 2001, Curtis & Riva 2009, Fuller & Moran 2001, Holland 1992, Tsoukas, 1998). A system's response to perturbations in these initial conditions may reflect the system's degree of robustness and flexibility (Drazin & Sandelands 1992), and the non-linearity which characterises complex systems means that a system's initial conditions can have an inordinate impact on outcomes (Houchin & MacLean 2005). However, as Rhodes & McKechnie (2003:60) observe, clearly defining "the state of the system", especially in a public administration context, is very challenging.

A system's initial conditions and history reflect the broader environmental context of which the system is a part. Acknowledging the role played by context when

undertaking a complexity theory analysis of a system is important (Byrne 1998:47, Marion & Bacon 2000). A complex system's context or "conditions", affect its ability "to support connectivity and interdependence to facilitate emergence and self-organisation" (Mitleton-Kelly 2003:21). Rhodes et al (2011:8-11) recount the necessity of updating their earlier complex systems model specifically to include environmental factors. (See Figure 10).

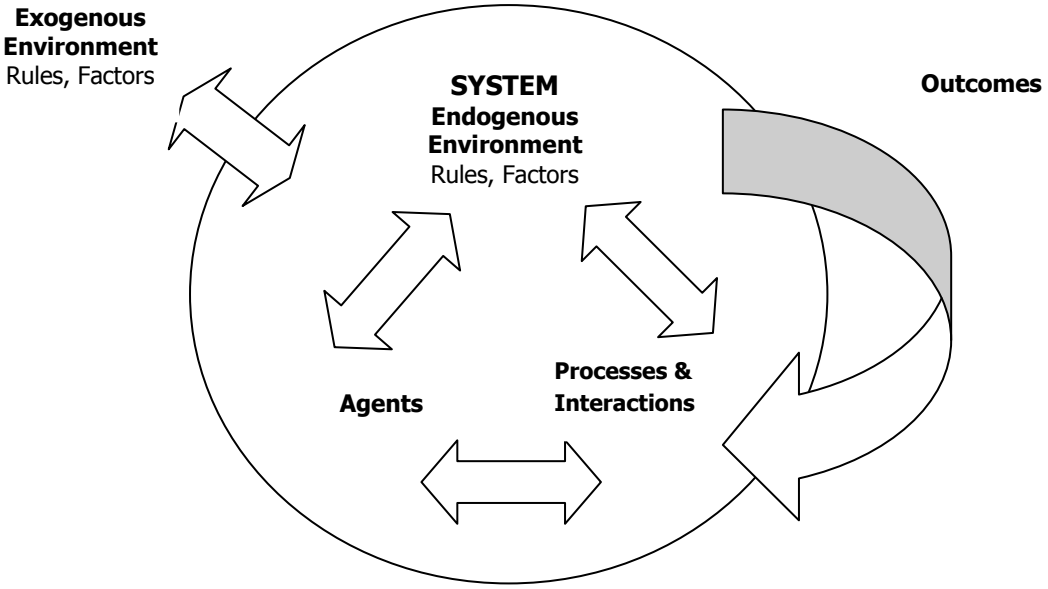


FIGURE 10: KEY FEATURES OF A COMPLEXITY THEORY ANALYSIS, HIGHLIGHTING THE IMPORTANCE OF ENVIRONMENTAL CONTEXT (SOURCE: ADAPTED FROM RHODES ET AL 2011, P. 11)

5. "Requisite Variety", or Diversity, Within the System

Complex systems are composed of diverse elements. Ashby's (1956) Law of Requisite Variety, proposes that a system's internal variety, or diversity, should roughly match the environmental constraints (or complexities) under which it operates if the system is to survive. Boisot (2003) observes this is also the case within organisations, something which the strategic planning function should reflect. In the case of human or social systems this means diversity in such aspects as the personal backgrounds, world views, mental schema and experiences of system members. Within complex systems, such diversity enhances the capacity of a system to manage complex and varied challenges and day-to-day realities (Leifer 1989, Axelrod & Cohen 2000), contributing to the system's robustness. Diversity is valued because it provides a wide range of possible responses to any given situation. The wider the range of variations, the more

likely it is that (at least) one option will become viable in "furthering the adaptability of the whole" (Goldstein et al 2010:179).

The preceding section presented an overview of the key, and most widely accepted, attributes of complexity theory and complex systems. The next section will discuss an apparent ontological divide between complexity theory researchers and whether it is important.

Complexity Theory: An Ontological House Divided?

Perhaps owing to its "importation" from the pure and natural sciences, as opposed to having arisen organically from within the social sciences, there is an often unspoken divergence amongst management scholars on the issue of teleology in complexity theory research. Specifically, the grounding assumptions and ontological beliefs of researchers divide along the lines of whether they view systems as ultimately moving toward a pre-determined, or formative, destiny, or toward an indeterminate, transformative, destiny (Stacey et al 2000:14, MacIntosh et al 2006).

A variation of this debate asks whether mathematical/physical domains and social domains are ontologically incommensurate, "not allow(ing) us to make simple conceptual shifts between these domains of reality" (Introna 2003:207). Complexity theory as applied in the mathematical and physical domain assumes "an a priori logic or set of operations that fundamentally constitute the system, independently of us and that only need to be unravelled" for us to understand and control the system (Introna 2003:209). Social systems, however, "are socially constructed and historically emerging" and are the result of their histories and the reflexivity of their members (Introna 2003). These systems are constantly changing as a result of human agency and the interaction of this agency with the systems' social structures; they are emergent, and their future state is unknowable.

These polarities might be characterised as "the Sante Fe school" versus "the transformative school", or following Houchin and MacLean (2005), as the "rules-based" and "connectionist" approaches respectively. Complexity theorists associated with the Sante Fe Institute in New Mexico, USA are among the world's best established researchers working within complexity theory. Their approach is almost invariably quantitative, including the limited work they do within the human and social sciences. They rely heavily on computational and mathematical modelling, even when studying human systems. As with all complexity scientists, they recognize the importance of

relationships within systems and the principles of emergence and self-organisation, along with the related phenomena of non-linearity, historicity, diversity and co-adaptation. However, their work is premised on the belief that a system's functioning is ultimately reducible to its constituent parts, regardless how lengthy or arduous an undertaking this reductive process may be. In the end, theirs is a search for predictability, effective intervention, and, ultimately, control. One of the commercial spin-offs from the Santa Fe Institute is the firm *Prediction*, which tries to forecast financial markets' movements (Thrift 1999). Well-known complexity scholars whose work is often associated with this approach include Bill McKelvey, Peter Allen, John Holland, and Murray Gell-Man.

Contrasted with the Sante Fe school is what might be called the "transformative school". Complexity theorists associated with this stream, many of them based in the United Kingdom, are unconcerned with predictability and less concerned with control. They are more focused on understanding the nature of the relationships, or ties, between agents in a system, the *general tendencies* of a system which result from these ties (as opposed to law-like rules), and with identifying potential sources of novelty, change and innovation. These scholars explore the impact of human agency and reflexivity on the systems they study, and the extent to which systems and their components co-adapt and co-evolve. Prominent researchers within this field include Ralph Stacey, Robert MacIntosh, Donald MacLean, Kevin Dooley, Stewart Kaufman, Brenda Zimmerman, and Ilya Prigogine. This thesis is grounded in this, "transformative", tradition.

Walby (2007:456) argues compellingly that this divide, whilst significant, "should not be exaggerated" or "overstated". The divergence between the two schools could helpfully be understood, she writes, as the Sante Fe school researchers focusing on dissecting and understanding the *internal* machinations of systems, whilst those working within the other school are more preoccupied with *external* relations. This further validates the importance which is placed on context and the external influences which must be acknowledged when a complexity theory approach is applied in analysing London's TB control system. Levin (2002:17) highlights an interesting aspect of the debate: "the central problem is to develop... appropriate... mechanics that allows one to separate the knowable unknown from the truly unknowable." The issue, then, may be whether the existence of "the truly unknowable" is accepted by researchers in both schools.

Murray (2003:410) offers an alternative model for capturing the "contrasting insights into complexity", although he notes that complexity researchers themselves "do not always appear to be aware of the distinction." He characterizes the two divergent narratives found within the complexity theory literature as the "molecular" view and the "network" view. The molecular view, he says, might be conceived simplistically as corresponding to the reductionist, positivist school of complexity theory, with the network view more closely aligned with an interpretivist approach. His categories do not correspond perfectly with the "Santa Fe" versus "transformative" schools distinction outlined above, but are relevant. The major difference with Murray's perspective may be that it focuses more on researchers' differing perspectives on the roles and impact of ties and interactions within a complex system, rather than the extent to which researchers differ on the issue of teleology. His views are presented, in a modified form, in Figure 11.

	Molecular View	**Network View**
Basis of existence and mode of self-organisation	• Simple underlying rules • Bifurcation • Dissipative system	• Strong and weak interactions, negative and positive feedback loops at play • Evolution and emergence • Edge of chaos
Nature of system trajectory/path	• System progresses along an (ultimately) pre-determined trajectory/path • Apparent, but not actual, unpredictability	• Above interactions alter a system's trajectory, or even create a new one • Outcomes unpredictable beyond short-term
Nature of System's Fitness	• System fitness is a function of the "rules and processes inherent in the system"	• System fitness is determined by the degree and nature of coupling between units. • Optimal fitness lies between units being too loosely and too tightly coupled

FIGURE 11– CONTRASTING VIEWS IN COMPLEXITY THEORY RESEARCH (MODIFIED FROM MURRAY 2003:412)

Just as there are differences in approaches to complexity theory, there are different dimensions that are included or excluded in complexity research. The next section discusses some "secondary" complexity theory concepts which are not addressed by this research. Specifically, the discussion focuses on specific modes of self-organisation and the role of system trajectories (or "attractors", in the language of complexity). Again, the lack of a commonly accepted definition of complexity theory means that this

list could surely be judged as incomplete. Nonetheless, it seems important to acknowledge widely-discussed complexity theory concepts excluded here.

Specific modes of self-organisation

The concept of self-organisation is not only at the root of complexity theory, but a vast literature has been produced examining it many facets, often in minute detail. Some aspects of self-organisation are contested, particularly concepts detailing the means by which self-organisation occurs. An example was cited earlier whereby some researchers believe organisational complexity could be unravelled by revealing a small set of simple rules which govern self-organisation, whilst other researchers believe this to be a futile exercise inconsistent with the anti-reductionist thrust of some complexity theory research. This section highlights a number of modes of self-organisation which have been identified in the literature, but which are not applied in this study, often because operationalising such concepts is both beyond the scope of this research and inconsistent with its ontological affiliation with the "transformative school" of complexity theory.

Owing to complexity theory's roots in the pure and natural sciences, many of the specific modes of self-organising behaviours which have been detailed in the literature arise from research conducted in laboratories or via computer simulation. Worked examples and empirical evidence supporting their existence in open, social systems is uncommon, but researchers like McKelvey (1995) and others associated with the Sante Fe Institute have attempted such work, and Anderson (1999) highlights some further examples. Generally, identifying the specific means of self-organisation within a system at the individual agent level requires the researcher to (a) take a long-term view of the system, analysing it over an extended period of time and using finely grained data to discern the patterns which characterise the self-organising system, and (b) to have access to a significant volume of quantitative data, often longitudinal survey data, and appropriate computing techniques and technologies to analyse this data. For instance, whilst Prigogine's dissipative structures research informs much of what we know about self-organisation, applying this knowledge to identify specific modes of self-organisation in social systems requires significant volumes of data to feed modelling simulations. The output of such models may well be worthwhile - representations of how systems evolve over time and how they appeared in the past (Drazin & Sandelands 1992) – but this mode of research is not obviously accessible to much of what is done by social scientists, including organisation theorists.

Dissipative structures, discussed earlier in this chapter, allow complex systems to import energy from the outside and then transform it (or "dissipate" it) in order to self-organise and make themselves more robust and viable. Through this dissipated energy, "bifurcation" is made possible, whereby systems switch between states of equilibrium and disequilibrium, or, some researchers argue, pose themselves "at the edge of chaos" (Axelrod & Cohen 2000, Brown & Eisenhardt 1997, Leifer 1989, MacIntosh & MacLean 1999).Two of the specific means by which self-organisation occurs within dissipated structures are known as "chemical clocks" and "cellular automata". Both of these important concepts refer to computer models which require the researcher to input significant amounts of detailed data along with "if-then" decision rules. The output is models showing exactly when a bifurcation occurred in a system, in the case of chemical clocks, or the impact of changing the nature of interactions amongst agents in a self-organising system, in the case of cellular automata. So whilst Prigogine's work has formed the basis of much complexity theory research within social science (Byrne 2006, Leifer 1989, MacIntosh & MacLean 1999, Pascale 1999), to be properly applied it requires significant amounts of longitudinal data, often collected by means associated with quantitative research. There remains disagreement within the literature as to whether it is possible for bifurcation points to be identified within social systems, with some scholars arguing it simply cannot be done (Johnson & Burton 1994, Gould 1987). Consequently, testing for the above means of self-organisation is beyond the scope of this work, although explicating such concepts may indeed have added to the value of this research.

The concept of "phase space" as a means of understanding self-organising behaviour is an abstract but important concept in the literature. But it, too, is most effectively applied using computer-based simulations or regression modelling (McKelvey 1995). Its objective is to identify "all the possible states – or phases – that the system can occupy" (Ramalingam & Jones 2008:31). These potential states are then represented graphically or in tabular form, providing potential intelligence as to when, for example, it might be most beneficial to intervene in a system to produce a desired outcome. Again, it is easy to see that building such a graphic model would require the input of significant quantities of finely detailed data. The collection of such data within many social settings would be difficult, including the system under study in this research; consequently, phase space models are not part of this thesis.

In general, computer and modelling-based research is misaligned with this narrative-based study of the "system of systems" which comprises London's TB control system. And further, such an approach would not assist with this research's objective of capturing the essence and richness of the relationships under study, and the context in which these relationships occur.

The situation is similar with another well-documented means of explaining self-organisation, the development of fractal structures within a system. The term "fractal" was created by mathematician Benoit Mandelbrot in the mid-1970s and refers to consistently recurring and similar shapes in groupings or forms that can be observed at all scales, or levels, of an object or system. Although the concept of fractals is firmly rooted in mathematics, geometry in particular, it has also been applied in social science to describe repeating, similar patterns observed across levels of a system (Plsek 2001, Thrift 1999). As well as being a means of self-organising, the presence of fractal structures within an organisation, usually in the form of teams or work groups, is seen as a means of ensuring the application of whatever small set of simple rules characterises a complex system. As with the other modes of self-organisation outlined in this section, identifying the presence of fractal structures in the London TB control system was not possible because of lack of access to the fine grained data required for such an analysis, coupled with the sheer quantity of data which would be generated by the approximately 70 components which comprise the London TB control system.

The concept that the repeated and rigorous application of a few simple rules within a complex system can lead to self-organisation is another well-known complexity theory concept, as mentioned earlier (Brown and Eisenhardt 1997, Drazin & Sandelands 1992, MacIntosh et al 2003, MacLean & Burns 2007, Phelan 1999, Plsek 2001). Two examples often cited in support of the "simple rules" argument are that of jazz ensembles (play in the same key, in a certain pre-determined sequence) and flocks of birds (stay in the same direction, keep a certain distance between you and other flock members, and always move toward the centre of the flock). The concept is clear and it is appealing in its simplicity and elegance. Furthermore, two from among the small number of empirically informed social science studies using a complexity theory framework (Brown& Eisenhardt 1997, Houchin & MacLean 2005) both uncover evidence of the "simple rules" concept within the organisations which they studied.

Nonetheless, a decision was taken against using the simple rules concept within this research. In the end, the search for rules is a reductionist exercise and contrary to the ontological underpinnings of this research, even if the rules do allow for some bounded emergence to occur within a system (Byrne 2005[4]). However, as also noted earlier, this research avoids such reductionist thinking and rather embraces the necessity of understanding local level actions and interactions amongst members of a system as a means of understanding self-organisation. This research shares Cilliers' (1998:107) view that "(i)n our analysis of complex systems ... we must avoid the trap of trying to find master keys. Because of the mechanisms by which complex systems structure themselves, single principles provide inadequate descriptions."

The final mode of self-organisation which is not developed by this research is that of "attractors" and "strange attractors". As with the theories and modes of self-organisation discussed above, the attractor/strange attractor concept comes to the social sciences from the pure sciences. A frequently used image of the strange attractor concept is Lorenz's butterfly attractor graphic, shown below in Figure 12, developed during his work as an atmospheric scientist studying the complexities of weather forecasting (Murray 1998). (Lorenz is also credited with developing the "butterfly effect" theory of weather whereby it is said that a butterfly flapping its wings in Brazil can cause a tornado in Texas, but this is only tangentially related to the original butterfly attractor concept [Murray 1998, Ramalingam & Jones 2008].)

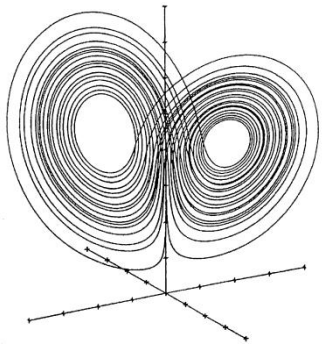


FIGURE 12: LORENZ'S "BUTTERFLY ATTRACTOR"

[4] Byrne further argues that the search for rules is motivated by the desire for credibility by organisational complexity researchers with colleagues working in the pure and natural sciences. Rules, he argues, can have the same status as "laws", thereby enhancing the credibility of the research and researchers identifying them.

The theory of attractors, when applied within the social sciences, holds that although complex, open systems can appear to behave randomly, or even chaotically, they are in fact moving in a pattern, always within a specific range, and according to many researchers, toward a pre-determined state (Murray 2003, Byrne 2005). As Ramalingam & Jones (2008:38) observe, "this 'narrowness of repertoire' is at the heart of order hidden in complexity". The pattern and range may be exceedingly difficult to discern in the absence of computer simulation, and in fact the attractor concept was developed only once technology advanced to the point where such simulation was possible. Again, ontologically this concept is at odds with that adopted by this research as it is reductionist and deterministic. It implies that with enough data the researcher can come to know a system's end state (and, ultimately, control it via effective interventions).

The preceding section outlined a number of complexity theory concepts, mostly related to specific modes of self-organisation and all of them important, which are not included in this research. The reasons behind excluding these concepts were also discussed. Having offered this comprehensive review of key complexity theory precepts and literature, the next section focuses on the gaps identified in this literature and explains how this research responds to them.

Gaps in the Complexity Theory Literature to be Filled by this Research

As demonstrated, interest in extending the study of complexity theory beyond the pure and natural sciences, where it finds its roots, has been growing since the mid-1980s. In academic terms complexity theory remains a young field, with researchers from the social and human sciences displaying ongoing interest in whether this "new science" can be used as a means of increasing knowledge and generating new insights within their various disciplines. In management studies, despite a sizeable and growing body of complexity theory research, there is still a lack of consensus amongst researchers regarding its potential to inform or augment management research.

This research addresses three gaps in the complexity theory literature within the social sciences, including management and healthcare studies:

1. A general lack of complexity theory-informed empirical research
2. A need for research analysing the management of complex organisational phenomena such as the case examined here, of an epidemic, and

3. A distinct shortage of research which analyses the important role played by the macro context or the "meta meta aggregate" (Marion and Bacon 1999) in which complex systems operate.

First, the significant and persisting lack of empirical research employing complexity theory within the social sciences is widely noted (Carapiet & Harris 2007, Chiles 2004, Houchin & MacLean 2005, Johnson & Burton 1994, Lissack 1999). Related to this is the need for further evidence that complexity theory-based studies can be successfully operationalised in the field. The vast majority of complexity theory research published within the social sciences, including management studies and healthcare, is conceptual and non-empirical. This is a significant shortcoming in terms of establishing the credibility and utility of complexity theory as a tool for generating knowledge outside of closed laboratory systems or via computer-generated simulations. The limited empirical work which has been done by management scholars is mostly high-calibre and often qualitative, retrospective and longitudinal in nature. Three studies in particular - Brown & Eisenhardt 1997, Chiles 2004 and Houchin & MacLean 2005, serve as useful methodological guides and templates for this research.

There are a number of other complexity theory case studies found in the management literature (MacIntosh & MacLean 1999 and 2001, Axelrod & Cohen 2000, Pascale & Milleman 2000), but whilst interesting and informative, most lack rigorously collected, longitudinal data, with empirical shortcomings noted by some of the authors themselves (MacIntosh & MacLean 1999, 2001). The research often applies complexity theory to situations as a retrospective tool of analysis, but rarely are empirical studies designed and executed as dedicated complexity theory research. Authors often select scenarios/cases, real or imagined, and then (a) apply complexity theory concepts and describe how these scenarios might be seen as exhibiting complexity theory attributes, or (b) argue, hypothetically, how improvements could be made to the situation if complexity theory concepts were applied (Lewin & Regine 2003).

It should also be noted that in the late 1990's the UK's Engineering and Physical Science Research Council (EPSRC) funded multi-year complexity theory studies in collaboration with the London School of Economics' Complexity Research Programme. These projects were entitled "Implications of Theories of Complexity for Co-Evolution of Business Process and Information Systems Development" and "Enabling The Integration Of Diverse Socio-Cultural And Technical Systems Within A Turbulent Social Ecosystem". This research was not able to locate any peer-reviewed publications

arising from these grants, nor were any final reports submitted to the EPSRC accessible to this research. However, a short case study discussing an international bank's use of complexity theory in upgrading its IT system, found in Mitleton-Kelly (2003) may have resulted from these projects.

Within healthcare research, again, empirical complexity theory research is limited. As with management studies, it often veers into the sort of hypothetical "scenario imagining" highlighted above, whereby researchers speculate on how complexity theory might explain a variety of situations or bring potential improvements. Sometimes it also describes how situations could be portrayed as exhibiting properties consistent with complexity theory concepts (Arndt & Bigelow 2000, Hassey 2002, Holt 2002, Kernick 2002: 93-121, Begun et al 2003, Litaker et al 2006, Plsek & Wilson 2001, Plsek & Greenhalgh 2001, Kernick 2006, Miller et al 1998). Other complexity research in healthcare employs quantitative analyses to illustrate various complexity theory concepts (Begun & Luke 2001, Anderson et al 2003, Leykum et al 2007, Love & Burton 2005), or is modelling-based (Agar & Wilson 2002, Papadopoulos et al 2001). Perhaps in response to this dearth of empirical research, the journal *Social Science and Medicine* produced a Special Issue on complexity theory in healthcare in 2012, with four empirical, complexity-based healthcare studies resulting (and briefly highlighted next). Nonetheless, "purpose-built" empirical complexity theory studies in healthcare are uncommon.

Exceptions to the above include: Zimmerman (1999); Simmons (2003); Marion & Bacon (2000); Dattée & Barlow (2010); Rhodes et al (2011); Essen & Lindblad (2012); Xiao et al (2012); Hannigan (2012); and, Trenholm & Ferlie (2012). Each of these papers will be highlighted briefly below.

Zimmerman (1999) presents three short, high-level "stories" from three different US healthcare settings to illustrate how complexity theory-inspired change initiatives were successfully implemented. She argues for greater use of complexity theory concepts within healthcare. Simmons (2003) discusses how the Welsh Public Health Laboratory Service made some limited use of complexity theory concepts when developing its communicable diseases managed care network, but the scope of the Welsh project seems to have been limited to the implementation of a new IT system. Marion & Bacon's (1999) research focused on organisational extinction using three American healthcare organisations: two eldercare organisations and one organisation focused on general healthcare issues. The authors used complexity theory to demonstrate how the

organisations adapted to their respective environments, or not. Dattée & Barlow (2010) provide mini case studies of five health boards in Scotland which were undertaking improvements to their delivery of "unscheduled care", but the actual application of complexity theory is limited. Rhodes et al (2011) produced a book-length complexity theory-led study on the implementation of a healthcare information system in Ireland. This research is perhaps the most detailed and well-worked example of complexity theory research to date, especially in a public management context, and has been helpful in informing this research (despite its self-proclaimed ontological leanings toward the "Sante Fe school").

Writing within the *Social Science and Medicine* special issue, Essen & Lindblad (2012) apply a dissipative structures model to understanding the success of 19 years' of ongoing, incremental improvements within rheumatology services in Sweden. Xiao et al (2012) apply a complexity lens in their analysis of the design and implementation of China's new "national essential drugs policy". Hannigan (2012) used a mental health setting in Wales for his complexity theory study, looking at connections at multiple levels of organisation within health and social care and emphasising the intended and unintended consequences when a new community-based role was introduced. Trenholm & Ferlie (2012) used a complexity theory lens to analyse TB across London, concluding it offered a useful, but partial means of understanding the resurgence of the disease and that the analyses was enhanced when features of the macro context were considered. This paper is found in Appendix A.

Second, there are calls for further empirical research from a complexity theory perspective into the management and understanding of social and organisational phenomena. Complex social and organisational phenomena may take the form of problems, challenges or tasks: raising a child; responding to a humanitarian crisis; or managing an epidemic or infectious diseases, including tuberculosis. Researchers noting the persistent lack of empirical research in this area, and usually calling for more, include Agar (1998), Agar and Wilson (2002), Byrne (1998), Gatrell (2005), Dean (1997), Tennison (2002), and Trochim et al (2006). Gatrell (2005:2667) argues that the complexity theory concept that systems may be far from equilibrium means that "the emergence and resurgence of particular diseases needs to be set in the wider context of changes that are economic, political and social...A good example would be Lyme disease...other examples (include) TB and HIV/AIDS...". Tennison (2002:85) discusses "the dangers of the appearance and reappearance of new and old health problems, such as tuberculosis..." and goes on to argue for "(m)ore study of healthcare

management by complexity methods and use of healthcare management case studies to elucidate complexity and identify possible tools to enhance management effectiveness" (2002:87). Researchers, therefore, have called for a complexity theory informed understanding of both tuberculosis as a phenomenon and its management. This research responds to that call.

The third gap addressed by this study is the lack of complexity theory research acknowledging the vital role played by the macro-context in which complex systems operate. This wider organisational and policy context is vital and needs to be incorporated fully in analysis (Byrne 1998:47, Marion & Bacon 1999). Even at the micro level, Mitleton-Kelly (2003:21) highlights the importance of context in facilitating positive, emergent results from self-organisation, noting such outcomes "are often blocked or restricted…by complicated" administrative practices. Begun et al (2003) allude to the importance of context in their brief discussion of how the Brazilian healthcare system tackled AIDS. Marion & Bacon (1999) also highlight the importance of the "meta-meta aggregate" context in their research into organisational extinction conducted within a complexity theory framework, but they do not fully operationalise the concept. This research, on the other hand, provides a major worked example.

The foregoing overview of complexity theory included a review of its literature, ongoing debates and differences amongst scholars within the field, and the limitations arising from this research in addressing certain aspects of complexity theory. Drawing on this discussion, the section below outlines the complexity theory concepts which will be operationalised in this research, along with a brief explanation as to why these particular aspects of the theory have been selected.

Features of Complexity Theory to be Operationalised in this Research

Following the preceding review of complexity theory literature, the complexity theory model operationalised in this research is based on the following five concepts:

1. self-organisation leading to emergent outcomes;
2. non-linear responses to environmental disturbances;
3. the role of historicity, sensitivity to initial conditions and context;
4. co-evolution and co-adaptation within the system; and,
5. the extent and nature of diversity within the system.

This research focuses on these aspects of complexity theory for the following reasons:

A. They are amongst those most frequently cited in the organisational complexity theory literature and are broadly accepted.
B. Based on a review of the tuberculosis management literature, these concepts will be helpful in analysing the system responsible for TB control in London.
C. They are consistent with this research's position regarding the teleology of systems, namely that systems are not moving toward a particular pre-determined destiny or outcome. The position adopted by this research is that a system's future state is indeterminate, sometimes changes mid-course and may be transformed.
D. Issues of simple pragmatics, including limits to available data and the dictates imposed by scarce resources - an inevitable constraint of independent PhD research.

Methodological challenges associated with this research are discussed in Chapter Five. However, based on the review of the literature, and the five features of complexity theory of interest as defined above, below are suggested ways in which these elements might be explored in this research:

1. *Self-Organisation:* Is there evidence of groups of actors within London's TB control system coming together, on their own, and, by so doing, producing novel, emergent outcomes?
2. *Non-Linear Responses:* Over the 25 years since TB rates in London started to rise, has the system or any of its components produced any unexpected or unpredictable responses?
3. *The Role of Historicity, Sensitivity to Initial Conditions and Context:* To what extent is London's TB control system impacted by the broader environmental context in which it operates? Is there evidence that actors within the system are aware of and impacted by the system's history?
4. *Co-Adaptation Within The System*: Is there evidence that the approach to TB control in London has changed as the nature of the TB problem has changed, at either the micro or macro levels?
5. *Diversity Within The System:* Is there diversity in terms of world views and professional experiences amongst actors within the system?

Concluding Comments

The approach to complexity theory espoused by this research aims to avoid the trap of "simplistic complexity" highlighted by Byrne (2005:97) whereby complexity

researchers, rather ironically, fall back on reductionist, cause and effect ways of thinking and avoid "engaging with complex complexity" (2005:96). This may arise from complexity theory challenging the traditional and often unarticulated view that organisations can be studied as objectified systems populated by managers (and researchers) who are rational agents able to make the "right" choices about how to manipulate their organisations (Stacey et al 2000:7,56-60). Other scholars have noted this as part of a larger tendency in which organisation theorists try to make their field more "scientific", and in so doing, avoid both the complexity inherent in organisations and constructing theories which are not clearly defined (Bouchikhi 1998). To avoid such pitfalls, "(w)e should rather be sensitive to complex and self-organizing interactions and appreciate the play of patterns that perpetually transforms the system itself as well as the environment in which it operates.' (Cilliers 1998:107). For healthcare reformers and managers, this sounds a cautionary note against engaging in excessive organisational control (Trenholm & Ferlie 2012), and encourages them to accept and leverage the possibilities arising from unpredicted, yet potentially positive, organisational responses (Plsek & Greenhalgh 2001, Plsek & Wilson 2001).

The next chapter will review the literatures relevant to the two alternative frameworks applied in this research: professional dominance and New Public Management.

CHAPTER FOUR: Critical Review of Professional Dominance, New Public Management and Kingdon's (1995) Public Policy Development Literatures

Introduction

As discussed in the previous chapter, this thesis uses complexity theory as its primary tool of analysis, but it also applies two other secondary, explanatory frameworks: professional dominance and New Public Management (NPM). Having just reviewed the complexity theory literature, this chapter reviews the literatures related to these two competing theoretical models. The chapter opens with a discussion of the theory of professional dominance and reviews its related literature along with that related to NPM. The remainder of the chapter introduces readers to a particular literature on public policy development, specifically Kingdon's (1995) theory on public policy development. This literature is reviewed and discussed as it is applied later in this thesis to theorise the important inductive finding related to the low priority accorded to TB control in London.

The Professional Dominance Literature

This discussion starts by briefly reviewing the origins and history of the theory of professional dominance, followed by an overview of the key concepts which define the theory. It then reviews contested areas within the literature, and specifically whether or not the theory has been usurped, or at least weakened, by social and political developments in recent decades. The impact and interplay of NPM organising principles on the theory will also be explored. Because the theory of professional dominance was ultimately found by this research to lack explanatory power, the discussion which follows is abbreviated relative to the overview of New Public Management which follows it.

Brief Historical Overview

The concept of "professional dominance", and medical dominance in particular, originated with Eliot Freidson's 1970 challenge to medical sociologist Talcott Parson's

widely accepted research into the norms and behaviours of professionals, including clinicians (Light & Levine 1988). Parson's research came to be viewed as outdated, with its premise of "the enlightened paternalism of doctoring" (Hafferty & Light 1995:134). In contrast, Freidson argued that clinicians dominate other professions in the medical field by maintaining "professional dominance", a special legitimated autonomy controlling the nature, terms and structure of their work (Barnett et al 1998, Freidson 1994:114-116). Since such autonomy must be granted, rather than taken, it is premised on a *quid pro quo* between the medical profession and the public; namely, the medical profession will self-regulate in accordance with the highest of ethical codes and in the absence of self-interest (Wolinsky1988).

Underscoring the success of physicians in securing this privileged occupational position, the entire healthcare system is such that "(h)ealth services are organized around professional authority, and their basic structure is constituted by the dominance of a single professional (the doctor) over a variety of other subordinate occupations" (Freidson 1970:xi). The result is a "division of labour strictly governed by hierarchical authority".

Freidson (1994:116-117) notes that the likelihood of new professions now gaining the sort of power and autonomy currently enjoyed by the medical establishment, even professions which are characterized by similar levels of education and training, is extremely low. Once managerial control is firmly ensconced, for example within the state-run healthcare sector, management and the broader organisational machine, not the workers, define and control the nature and specifics of jobs and tasks.

Features of the Professional Dominance Model

The relationship between the patient or client and the professional is based largely on trust. By assuming the responsibilities arising from risk management and the accompanying patient/client trust, "professionals are rewarded with authority, privileged rewards and higher status" (Evetts 2003:400). Referring specifically to physicians, Allsop (2006:445) highlights the importance of the "cultural authority" and "privileged social status" accorded the profession. Professionalism, then, is used as a mechanism of social control by members of professional groups; or, more positively, as a means of imparting civility and stability in social systems (Evetts 2003).

Professionalism exists when

> *...an organized occupation gains the power to determine who is qualified to perform a defined set of tasks, to prevent all others from performing that work, and to control the criteria by which to evaluate performance...(thereby creating) the circumstances under which its members are free of control by those who employ them* (Freidson 2001:12).

This assumes that the work undertaken by professionals is so specialised that it excludes all but those with the required training and experience (as decided upon and enforced by the professionals themselves) and that the work cannot be commoditised or standardised (Freidson 2001:17, 84, 92-93). This "monopoly" is essential to professionalism; consequently there will always be conflicts with the logic of free markets and competition (and hence, with NPM) (Freidson 2000:3).

The impact of professional dominance, including medical dominance, has been analysed at the organisational level. Hospitals are comprised of a strong core of professionals and organized as "professional bureaucracies" with complex, stable environments, featuring high levels of decentralisation, with only a small role for managers, but with a significant need for support staff (i.e., hospitals include many more allied health professionals and administrative support workers than doctors) (Mintzberg 1983:189-213). Members of professional bureaucracies often have less loyalty to the organisation than to their profession (p.208). With respect to medicine, Mintzberg notes medical consultants perform largely standardised work, despite its complexity, and these standards are set, and perpetuated, by the profession itself, thereby enhancing the profession's autonomy (Mintzberg 1983:190-192,197).

Professional bureaucracies present exceptional management challenges. Professional administrators working within these organisations are not powerless, but neither can they impose solutions. And while, individually, these administrators might be more powerful than individual professionals, they "can be easily overwhelmed by the collective power of the professionals" (Mintzberg 1983:200). Management is also challenged by professionals, especially medical professionals' proclivity for independent working and an aversion to embracing directives resulting in change or new ways of working (Mintzberg 1983:190, 209, 213).

The State of the Professional Dominance Model Today

Over the past two decades or so, the professional dominance model, and the medical dominance model in particular, have been criticized on several fronts owing largely to three, late-20th century developments:

1. a potential de-professionalisation or "proletarianisation" of the profession;
2. a general increase in government involvement and regulation in medicine along with the increased power for HMOs as healthcare purchasers in the US; and,
3. the rise of the New Public Management doctrine, particularly the increasing influence of managers and the introduction of quasi-markets into healthcare.

De-professionalisation or proletarianisation

The "de-professionalisation or "proletarianisation" of the medical profession refers to developments eroding the control of clinicians over the conditions, structures and boundaries of their work, including how they are remunerated (Barnett et al 1998, Light & Levine 1988, McKinlay 1988, Wolinksy 1988). Technological advances enabling enhanced surveillance of resource use, along with the application of clinical practice guidelines, treatment protocols and evidence-based medicine are drivers (Hafferty & Light 1995, Barnett et al 1998), although recent research suggests physicians are ignoring, or resisting, such guidelines (McDonald et al 2006). However, the very existence of such officially sanctioned guidance speaks to a shift away from the once unquestioned status of clinician autonomy.

Increased government involvement and regulation

An overall increase in government involvement and regulation in medicine has reduced the domination of the medical profession. This occurs largely in response to two developments: (a) medicine's inability or unwillingness to control upwardly spiralling healthcare costs (Hafferty & Light 1995, Allsop 2006), and (b) revelations of medical incompetence, self-interest and mismanagement, all of which are seen to weaken the social contract between the public and physicians (Barnett et al 1998, Allsop 2006). Moran (2003:82-83) observes that the UK medical profession has been self-regulating since the founding of the General Medical Council in 1858, but towards the end of the 20th century cracks began to appear within the profession itself regarding aspects of this self-regulation, accompanied by highly publicised scandals about the behaviour of doctors. Moran argues that the compact between doctors and government at the founding of the NHS has collapsed, owing to various economic crises, starting in the 1970s, scandals, and increased public demand for accountability.

Further, today's public exhibits significant consumerist tendencies, having grown accustomed to unprecedented levels of choice in both goods and services offered them. This "consumerism", combined with an increasingly educated public less inclined toward deference to the medical profession, has given rise to growing patient advocacy and demands. This, in turn, has provided "some legitimate basis from which otherwise powerless managers can attempt to exercise control over powerful medical professionals" (McDonald et al 2006:197).

The rise of the New Public Management doctrine and its impact on the medical profession

New Public Management (NPM) inspired governments are placing new demands on the medical profession. Criticisms of large, powerful bureaucracies with their largely professionalised workforce, combined with a desire to make the welfare state smaller via privatisation and to give greater prominence to private sector-style management techniques, have fuelled NPM. This also involves seeking ways to control professionals, a group regarded with some wariness by NPM adherents (Sehested 2002) because of their power as producers of public goods. Both medical dominance, and professional dominance more generally, have been undermined by NPM principles, although there is debate regarding the extent of this (Allsop 2006, Ferlie et al 1996:166, McNulty & Ferlie 2002:9, Harrison & Ahmad 2000). The introduction of "managerialism", enhanced powers for managers relative to physicians, and the introduction of quasi-markets focused on performance and measurement (Ferlie et al 1996:11,165-194), have combined in an assault on various medical monopolies (Allsop 2006).

NPM doctrine is based on the belief that applying private sector approaches will result in enhanced system efficiencies, leading to better value in care (Barnett et al 1998). Within the medical profession, for instance, the use of previously unknown phenomena such as clinician performance evaluation is an example of how this drive for better value has manifested (Hafferty & Light 1995).

Contracting-out services to privately run companies is another example of how medical professionals are impacted by NPM (Ferlie at al 1996:173). An empirical study on the establishment of "independent sector treatment centres" (ISTC), public-private partnership facilities which have assumed responsibility for the delivery of certain basic NHS services, shows a range of effects, including the potential for "a rise in transactional professional employment... rather than ongoing relationships" (Bishop & Waring 2011: 326). This could change the current social contract with clinicians,

including weakening their professional status and driving more intra-profession competition.

The introduction of NPM-inspired quasi-markets in the NHS has increased fragmentation within the healthcare system, and, among other things, has created a system of contractually mandated targets and performance standards for medical professionals. Medical dominance has been impacted, usually negatively, by quasi-market reforms (Ferlie et al 1996:176-178, Harrison & Ahmad 2000, Allsop 2006). The combination of contracting out (c.f. Bishop & Waring 2011), a shift of power from high-status, high-earning hospital consultants to GPs (via GP fund holding and latterly, PCTs and Clinical Commissioning Groups), and the creation of hybrid clinician-managers[5], have combined to change the nature of power sharing between clinicians and the state and amongst physicians themselves (Ferlie et al 1996:166-178

Medical Autonomy in the NPM state

The concept of professional autonomy (along with the idea of controlling the work of others) is central to the professional dominance model. Within NPM-based regimes, professional autonomy takes three main forms: political; economic; and, technical (Ferlie et al 1996:169). Political autonomy refers to the profession's right to make policy decisions, economic autonomy refers to their right to set their own standards of remuneration, and technical autonomy means the profession sets its own professional standards and controls the performance of its members. These three forms of autonomy apply, albeit within some boundaries, to physicians. Similarly, the medical profession remains self-regulating, although there have been concessions to permit more lay scrutiny following high profile clinical debacles (i.e., Bristol Royal Infirmary and Royal Liverpool Infirmary) and clinical practice and prescribing guidelines are now accepted as the norm.

The government's failure to consult physicians prior to introducing quasi-market reforms in the NHS in the early 1990s represented an important break in the longstanding tradition of "consensus politics" which had come to characterise the relationship between UK doctors and the state (Allsop 2006:446). This threatened

[5] Although this may also be a way of wresting some control back from managers (Ferlie et al 1996:182-183,193-194, Allsop 2006, Hartley 2002). Harrison & Ahamad (2000) and Harrison & Dowswell (2002) do not accept this assertion and see the rise of clinical directors as a further assault on medical dominance, by augmenting the management function.

physicians' traditional role as key players in policy formulation[6] (Ferlie et al 1996:176). Doctors also lost some of their power to act as "gatekeepers" and rationers of health services, with managers and commissioners assuming much of this power.

Medical autonomy occurs at three distinct levels: micro, meso and macro. Some maintain that it "is hardly contentious" (Harrison & Ahmad 2000:129) to claim a decline occurred in medical autonomy and dominance from 1975 to 2000, observing that this decline has been greatest at the micro level where individual physicians exercise clinical discretion. "New institutions of clinical governance"(p.135) such asthe National Institute for Clinical Excellence (NICE) are evidence of this argument These organisations contributed to a lessening of autonomy for physicians at the micro-level. "The boundaries around clinical decision making have become more permeable", evidenced by increased input and participation from external stakeholders such as consumers, lawyers and healthcare managers (Allsop, 2006:453). More than 15 years' worth of government sanctioned initiatives designed to enhance patient involvement in the NHS have led to "a wider questioning of professional dominance. With this comes a growing recognition that the role of the patient is changing from one which is as a passive recipient to one as informed partner" (Peckham et al 2005:226).

At the meso level, medical autonomy was less impacted, but starting with Conservative governments from the early 1980s,"(t)he piecemeal dismantling of some of the unilateral rights conferred on medicine as part of its corporatist relationship with the state has...continued" (Harrison & Ahmad 2000:137). At the macro level, which concerns the impact of changes to the "biomedical model" (as opposed to a public health model) on medical autonomy, the authors conclude there has been virtually no change

Concluding Observations Regarding Professional Dominance

Debate continues about the impact of recent political and social developments on medical dominance, and indeed on the professional dominance model more generally. However, for the most part, the debate is not about *whether* these models have been

[6] The recent – and largely futile - outcry from the BMA and various medical Royal Colleges against the 2011 health and social care reforms, the profession's initial loss of policy making power, and the government's disinterest in reaching consensus with the medical profession, indicate this loss of policy influence continues. This latest "defeat" follows other earlier, and equally important, government initiatives opposed by the British medical establishment. These include the creation of the NHS itself in 1948 and the implementation of the 1983 Griffith's Report recommendation to replace "consensus management" within the NHS with general management and general managers (Harrison & Ahmad 2000).

impacted, but rather the *extent and nature* of the impact (for example, Ferlie et al 1996, Waring & Currie 2009, Allsop 2006, Freidson 2001, Currie et al 2012).

Freidson, arguably the "father" of the professional dominance model, is highly sceptical, perhaps even hostile, toward claims regarding the potential demise of the model, citing an absence of empirical support and a lack of analytical consistency in the research (Freidson 1994:118-199, Freidson 2001). Other scholars agree, although their arguments are more nuanced, concluding generally that medical dominance still exists, even if there has been some multi-directional power-shifting and loss of power at the level of individual physicians (Ferlie et al 1996:191-193, McNulty & Ferlie 2002:50-51,342, Allsop 2006). Currie et al (2012) found clear and recent support for the robust nature of medical dominance. Whilst strongly asserting that medical dominance has significantly declined over the past 35 or so years, others concede that the changes have not always been clear cut or linear (Harrison & Ahmad 2000; Harrison & Dowswell 2002But few would agree that medicine has seen the extent of proletarianisation, de-professionalisation or overall loss of power and autonomy anticipated by early "anti-professional dominance theory" proponents.

Within the NHS, there are indications that medical dominance, in its traditional sense, has suffered a net decline after three decades of NPM orientated governments. While the medical profession remains the dominant force within healthcare, the profession is no longer immune to NPM-inspired democratic, cost-saving and consumer-led initiatives.

Having just provided a critical review of the professional and medical dominance literature, including a review of the debate amongst scholars regarding the current veracity of the professional dominance model, the discussion now turns to the third theoretical framework used in this thesis, New Public Management.

New Public Management

The third conceptual framework employed in this research is New Public Management (NPM). The review of NPM literature begins with a brief history of NPM, followed by a review of the key NPM principles and a discussion of areas of dispute, or contest, particularly whether a "post-NPM" era has now taken hold. Extensive fragmentation, excessive focus on control and risk-aversion, and managerialism all flow from the imposition of NPM and are issues of relevance to this study.

A Brief Historical Overview of NPM

Similar to "complexity theory", "New Public Management" is best conceived as a collection of ideas, or "a shorthand name for the set of broadly similar administrative doctrines" which found favour with bureaucratic reformers starting in the late 1970s (Hood 1991:3). NPM advocates believe government is improved when it becomes more business-like in its approach to service delivery.

> *The core... ideology...is that public sector provision was inefficient and often ineffective; that it led to neither cost containment nor to quality improvement...and that, if left unchecked, it would see unacceptable growth in tax bills...and declining standards of public services.* (Dawson & Dargie 2001:34).

The term "NPM" refers to significant, indeed transformative, change brought to public sector management practices following Margaret Thatcher's 1979 election victory in the UK. But NPM-style governing also attracted wide followings in the US, Australia and New Zealand starting from the early 1980s. Within the UK, NPM continued to find broad political support with the subsequent elections of both the Conservative Prime Minister John Major and his Labour successors, Prime Ministers Blair and Brown. The Coalition Government, in place at the time of writing, continues to carry the NPM torch. Political and party ideology does not explain widespread acceptance of NPM by governments from across the political spectrum (such as Sweden's social democratic government) or recent history in the UK (Hood 1995). Diefenbach (2009[a]:892) describes NPM as "an increasingly global phenomenon", spreading beyond its Western roots to developing countries in Asia and Africa.

The result of over 35 years of NPM-friendly government in the UK is deeply embedded features of the doctrine within the public sector and public services delivery. Nowhere is this more marked than within healthcare, which has long been seen as a "high impact" sector for implementing NPM ideas (McNulty & Ferlie 2002:53). This enduring nature of NPM within the healthcare sector has had a considerable impact on TB control in London.

Key Features of NPM

Whilst there is no single, universally agreed definition of NPM, Ferlie et al (1996:10-14), present four models of the doctrine, representing its evolution over time (see Figure 13 below).

Efficiency Drive (dominant throughout 1980s)	**Downsizing and Decentralization** (in place by mid-1990s)	**In Search of Excellence**	**Public Sector Orientation**

• Increased focus on:
  ○ Financial control
  ○ Target setting & monitoring
  ○ Audit function
  ○ Role and rights of consumers
• Reduced power for professionals, including power of self-regulation
• Enhanced power and authority for managers
• Increased degree of management hierarchy
	• Search for increased organisational flexibility
	• Creation of autonomous business units
	• Contracting out non-strategic functions
	• Flatter organisational structures with fewer employees
	• Separate purchaser and provider functions (quasi-markets)
	• Enhanced inter-organisational role for networks and strategic alliances
		• Focus on organisation culture and a rejection of "Efficiency Drive" model
		• Can take either a "top-down" approach, i.e., charismatic leadership, or a "bottom up" approach, i.e., a learning organisation
			• Fusion of public and private sector management ideas
			• Increased focus on local users and citizens
			• Focus on "quality", including using such tools as Total Quality Management
			• Recognition of uniqueness of public service and scepticism re: role of market in public sector
			• Move back to elected, local boards, away from appointed boards

FIGURE 13 – FOUR MODELS OF THE NEW PUBLIC MANAGEMENT (ADOPTED FROM FERLIE ET AL 1996:10-14, MCNULTY & FERLIE 2002:*343-347)*

Four key changes which have been observed in the UK after the advent in 1979 of NPM-friendly governments include:

1. The privatisation of previously government controlled economic activity
2. "Managerialisation" and marketisation of social policy functions
3. Widespread use of audit, performance measurement, and increased central controls
4. An increased focus on change management initiatives, including more focus on individual leaders and the emergence of high-profile chief executives (Ferlie et al 1996:3-6).

This research found evidence of all four of these changes within London's TB control system. Two of them - managerialisation and an increased preoccupation with control – are particularly relevant and discussed in greater detail, below.

Drawing on Hood (1991), Dawson and Dargie (2001:38) highlight a fundamental contradiction embodied by NPM. By promoting both marketisation and the implementation of private-sector management techniques like performance management, NPM draws

> *(o)n two competing conceptual frameworks. One akin to managerialism…supported the introduction of private sector practices…The other, with its emphasis on markets, derived from variants of public choice, rational choice and 'new institutional' economics.*

This has resulted in decentralization and competition operating alongside the centralizing tendencies of many private sector management techniques.

Hood (1991) offers another widely accepted perspective on NPM, summarised in the form of seven key NPM doctrines, as shown below.

	Doctrine	*Meaning*	*Typical Justification*
1	Hands-on professional management	Active, visible, discretionary control of organisations from named persons "at the top", 'free to manage'	Accountability requires clear assignment of responsibility for action, not diffusion of power
2	Explicit standards and measures of performance	Defining goals, targets, usually in quantitative terms, especially for professional services	Accountability requires clear statement of goals; also important for efficiency
3	Greater emphasis on output controls	Resources allocations and rewards linked to measured performance	*Results* more important than *procedures*
4	More disaggregation of units	Break-up of formerly monolithic units, more corporatized units around products, decentralised one-line budgets, arms-length relationships	Purchaser-provider splits, 'manageable' units, efficiency gains via contracts both within the public service and externally
5	Shift to greater competition	Term contracts and public tendering	Rivalry seen as key to lowering costs and improving standards
6	Stress private-sector styles of management	Move away from military-style public service ethic, more hiring flexibility, more use of PR/communications to general public	Need for "proven" private sector management tools
7	Stress on greater discipline and parsimony in resource use	Cost cutting, resisting union demands, limiting "compliance costs" for business	Need to control public sector spending and "do more with less"

FIGURE 14: DOCTRINAL COMPONENTS OF NEW PUBLIC MANAGEMENT (SOURCE: HOOD 1991)

Clearly there is significant overlap between the elements of NPM identified by Ferlie et al (1996) and Hood (1991). Those common elements of most relevance to this research

are discussed in greater detail below. As will become evident to readers, some of the categories overlap and creating neat distinctions amongst them was not feasible.

Key Precepts in NPM

Quasi-Markets

The introduction of quasi-markets within the public sector provided the scaffolding for most other NPM concepts. These "internal markets" lie at the heart of NPM and reflect most clearly the doctrine's desire to make government more business-like and to bring its operations more closely in line with those of the private sector. Quasi-markets are seen as a means of instilling discipline and rigour in a system which, neo-Liberals argue, lacks both. Quasi-markets aim to increase quality and cut costs across the public service; they also complement another key NPM principle, a preoccupation with performance measurement (McNulty & Ferlie 2002:6-57).

Dawson & Dargie (2001:35) observe that the term "quasi" is important because it speaks to two significant limits imposed upon the market mechanism - limits, "rarely, if at all, found in the private sector". First, the total size of the market is decided by government via the funding it makes available to a sector or programme. Unlike true markets, quasi-markets can never grow as a result of successes, nor shrink as a result of failures. This means "firms" competing within the market are involved in a "zero sum game" whereby any increase in market share comes "at the expense of other players" (Dawson & Dargie 2001:36). Market exit and failure, key to the functioning of "real" markets, is exceedingly difficult in many public sector settings, especially when it comes to the healthcare sector and closing poorly performing hospitals (Ferlie et al 1996:59). Second, government dictates permissible activities for organisations operating within the quasi-market. For example, NHS trusts were forbidden from selling services to private individuals (a rule which has since been significantly relaxed with some Foundation trusts now permitted to earn up to 30% of their income from private patients[7]). Quasi-markets are "highly internally regulated. The centre retained formidable powers of regulation, rule-setting and appointment to key posts" (Ferlie et al 1996:58).

[7] For example, the Royal Marsden NHS Foundation Trust's "Forward Plan Strategy Document for Plan for y/e 31 March 2012 (and 2013, 2014)", as submitted to the Foundation Trust regulatory agency, Monitor, refers to "A new marketing plan focused on the capture of new private markets both within the UK and overseas" with the objective of increasing private income by £9m in 2012.

An overview of NHS reforms focusing on the introduction of the internal market around 1989 notes three official reasons for its adoption: (a) "to achieve 'better value for money'"; (b) to increase NHS staff responsiveness to patient needs'; and, (c) to enhance the variety of services available to patients, whilst allowing them to choose amongst these services (Allen 2009:374). However, as these measures were introduced into a well-established "hierarchical public organisation" (the NHS was created in 1948), ensuring success of such radical, and private-sector inspired, reforms, was never going to be easy (Allen 2009:374). Empirical evidence shows limited increases in efficiency wrought by the introduction of the internal market, yet successive governments continue to support it. Despite softer rhetoric on NHS marketisation from Labour Prime Minister Tony Blair, and some effort to reintroduce elements of co-operation along with competition during his time in government, the NHS quasi-market remained firmly in place during Blair's tenure. In fact, Allen argues, there were efforts to strengthen the internal market, particularly in terms of enhancing the "supply side" of the competition equation.[8] The Coalition government's recent health and social care legislation further entrenches market principles and marketisation, although this initiative, too, sought to reiterate the value of co-operation (without offering concrete measures on how to do so). In sum, the NHS internal market is alive and thriving (in concept, if not always in execution).

Before the advent of internal markets, government bureaucrats working within (and sustaining) hierarchical structures and organisations, developed policy and planned how public funds would be allocated to support various government priorities and to deliver public services. With NPM and quasi-markets, governments often use public funds to purchase services for the public from private, non-profit or voluntary sector organisations (McNulty & Ferlie 2002:56). This system of "contracting-out" requires government to enter into often complicated, lengthy and performance-driven contractual agreements with its various service providers. Once contracting-out becomes the norm, the fundamental relationship between government and citizen changes to one more akin to principal-agent as opposed to the traditional trustee-beneficiary relationship. "Low-trust arms'-length contract relationships" can make it more difficult for governments "to retain the capacity to negotiate across

[8] Allen (2009) notes one of the objectives of enhancing the number and diversity of healthcare providers is giving "suppliers" the "freedom to innovate and improve services". This will be shown as particularly ironic in light of the empirical evidence presented later regarding the Find and Treat team.

organizational frontiers without massive transaction costs" (Dunleavy & Hood 1994:12).

The quasi-market mechanism splits the purchaser and provider, often leading once vertically integrated organisations and departments to become disaggregated, with their formerly integrated functions, like purchasing and providing, becoming separate (McNulty & Ferlie 2002:56). Within the NHS, the creation of Primary Care Trusts (PCTs) which employ "commissioners" to negotiate for and "purchase" healthcare services for residents living within the geographical boundaries of the PCT is an example of this split[9]. These services are purchased from various healthcare "providers", such as hospitals (often NHS Foundation Trusts, another spawn of NPM), GP practices, voluntary groups, social enterprises or privately held companies. Providers are meant to compete against each other, driving costs down for the purchaser (ultimately, the taxpayer, whose agent is the PCT), while "market forces" are meant to ensure sufficient levels of quality and value in the services provided.

The disaggregation which flows from quasi-markets often "hollows out", via downsizing, formerly strong and powerful line departments within government, severely reducing or eliminating their policy making cores (Dunleavy 1995). Sometimes arms-length, stand alone agencies are created during this process. This type of disaggregation can lead to "the erosion of central government's long-look or planning capability", accompanied by the risk of "large policy fiascos" (Dunleavy & Hood 1994:11). As will be discussed later, the Department of Health's TB policy making function has been effectively eliminated through downsizing and the creation of the (officially) arms-length Health Protection Agency (thereby further fragmenting the system).

Managerialism

Managerialism, or the shift whereby public sector "administrators" become more directive and "managerial" is another key component of NPM. Former private sector CEOs, often charismatic and with strong leadership skills, are recruited to support these newly empowered managers in carrying out their enhanced roles (McNulty & Ferlie 2002:58). Power shifts towards managers who set targets and monitor employee performance (Ferlie et al 1996:11), and often away from professionals, including medical professionals. Whilst managerialism has significantly impacted professionals, it

[9] At the time of writing, PCTs were being abolished and replaced with GP-led Clinical Commissioning Groups

has also privileged the management function above other functions within government. Strong and effective managers are vital to support many NPM objectives, including the quasi-markets discussed above, and to meet the associated demands for strong contracting skills. The disaggregation of line departments into quasi-autonomous agencies, or into separate purchasing and providing functions, also requires strong managers to oversee contracting and other processes. This more formal, business-like approach replaced the traditional public administration method of relying on personal relationships across or between departments to meet policy objectives.

Another implication flowing from the managerialisation of the public service is "bureau shaping" in which senior (and self-interested) managers institute NPM-type reforms such as severe cost cutting, contracting-out, or "hiving off" difficult frontline work to newly spun-off (i.e., disaggregated) organisations or decentralised, localised "branch offices". Effectively, they construct "small, high-powered strategic agencies divorced from all the messy problems of implementing policy on the ground" (Dunleavy & Hood 1994:12).

Managers in Healthcare

As discussed previously, medical autonomy and dominance within the NHS has changed as a result of NPM. This is part of a wider re-distribution of power within the healthcare system (Ferlie et al 1996:108,182-183). Power has not only shifted from the medical profession to managers, but, has also shifted within the medical profession. The creation in the early 1990s of GP Fund Holders and the recent move to create Clinical Commissioning Groups shifts power towards GPs and away from hospital consultants. Managerialisation within the NHS has produced so-called "hybrids" known as Clinical Directors, clinicians who become managers (McNulty & Ferlie 2002:59). Although government has invested considerable sums in training and supporting these clinician-managers, evidence to date is mixed on their success, at least in terms of wresting power from the medical profession (McNulty & Ferlie 2002:342). However, incumbents in these roles start to identify more closely with their management colleagues than with their medical colleagues (Hartley 2002). The response by the medical profession to these on-going, NPM-driven changes is best described as "adaptation" (Ferlie et al 1996:190).

Within London's TB control system, whilst doctors were perceived as influential, there was little evidence of them exerting influence compared to managers, as will be discussed more Chapter Seven.

Risk Aversion and Control

Another important NPM feature is its relentless focus on measurement, audit and targets, as a means of control. Goodin et al (2006:14-15), invoking the widely cited "steering not rowing" description of NPM, note that "performance standards" assist public servants by defining the outcomes expected from their work. This approach is not new. In the feudal system tax collection was contracted to nobles under strictly stated terms. And Plato's avowedly authoritarian *Republic* provided "the earliest images of the steering state. This concept of 'steering' "helps explain much of the fixation of the new public management on monitoring and control" (Goodin et al 2006:14-15).

Public servants working under NPM regimes face unprecedented levels of performance evaluations, goal and target measurement and audit. The "practices of accounting and auditing (play) a central role in operationalizing the administrative ideals that constitute the NPM" (Power 1997:44). The advent of NPM ushered in a change in the very meaning of the term "audit", from a "Victorian concern with...ensuring that spending could be accounted for, to a wider concern with the dominant themes of the new public management, such as efficiency and effectiveness" (Moran 2003:153). The erosion in central capabilities flowing from disaggregation and hollowing-out demands an increased role for the audit function and enhanced measurement systems (Power 1997:44). NPM-led systems use the information created for, and by, systems of accounting and audit to exercise and try maintain control wherever possible (and perhaps even when it is isn't possible), eroding the traditional level of trust placed in civil servants as agents of public service (Christensen 2009). Others see these systems as a means to "satisfy the need to connect internal organizational arrangements to public ideals" (Power 1997:10).

The use of audit has also become a means of defining performance measures, although often it is not obvious what these measures should be. Consequently efficiency and effectiveness is "not so much verified as constructed around the audit process itself" (Power 1997:51), where "organizations must be changed to make them auditable" in order to support NPM priorities. In other words, the tail wags the dog in the name of feeding the NPM cause.

"Power to the Patients"

NPM can be conceived as a web with key features intricately and closely connected and supporting each other, as seen with the role of "consumers", including patients, in an NPM context. This perception of patient involvement and their role as "consumers" arises naturally in a healthcare system where governments embrace a doctrine - NPM - suspicious of "big government" and which is focused on pushing political power down to local levels. Further, the infrastructure needed to enable patient empowerment programs is supported by the localism and performance-managed culture promoted by NPM.

Measurement and evaluation tools are used to support this increased involvement and focus on the users, or consumers, of public services. Emphasis is placed on consumer "choice and quality" in the services being offered, although there is some evidence that this is less the case in healthcare than with other public services such as education (McNulty & Ferlie 2002:57-58). Engaging or contracting out to the third or voluntary sectors in delivering services once provided by the public sector is intended to enhance responsiveness to consumers of public services while potentially lowering delivery costs. This "inter-sectoral blurring", reflected in the rise in both public-private and public-third sector partnerships (Ferlie & Steane 2002, Newman 2001:24), is a feature of later iterations of NPM and is found in London's TB control system, as will be discussed later.

Although there have been ongoing decentralisation initiatives within the NHS since its inception, efforts to enhance patient involvement intensified in the early 1990s. Often there is an inherent contradiction in decentralisation schemes which require, and are accompanied by, centralisation, or re-centralisation, programmes. Highly decentralised patient involvement initiatives, operationalised at the local level, are the result of top-down, central government programs, for example of lay appointees to NHS boards requiring the approval of the central NHS Appointments Commission (Peckham et al, 2005). Arguably, this underscores the interconnectedness of NPM concepts and "is perhaps as much at the mercy of the increasing tendency for governments to define the outputs through performance targets, national service frameworks and central regulatory functions as any other aspect of the NHS." (p.227)

Having reviewed the major components of NPM, it is useful to analyse them from an organisational theory perspective. Diefenbach (2009) suggests that NPM doctrine can

be theorised as impacting five specific areas of organisational practice, as summarised below in Figure 15.

Area	Element
Business environment and strategic objectives	▪ Challenging external environment calls for new strategies, including market orientation ▪ Increased focus on efficiency, customer needs, cost cutting, competition, privatisation, outsourcing
Organizational structures and processes	▪ Decentralisation, less hierarchy ▪ Focus on process and standardisation
Performance management and measurement systems	▪ Systematic measurement and monitoring of individual and organisational performance via targets and performance indicators
Management and managers	▪ A "management culture" emerges, resulting in new types of managerial posts and privileging management over other competencies
Employees and corporate culture	▪ "Leadership" valued ▪ Employees expected to become more "business-like", maybe entrepreneurial

FIGURE 15: BASIC ORGANISATIONAL ASSUMPTIONS AND CORE ELEMENTS OF NEW PUBLIC MANAGEMENT (MODIFIED FROM DIEFENBACH 2009)

Decentralisation? Fragmentation?

With its enthusiasm for localism, NPM naturally leads to high levels of operational decentralisation, but this is partially offset by strongly centralised steering initiatives such as incentives and contracts. In practice, the outcome of "decentralisation" cannot be easily distinguished from the less desirable concept of "fragmentation", and perhaps they are best thought of as having a causal relationship; the former contributes to the latter. Whilst decentralisation as a concept is widely embraced as a positive approach to governing, there is a long history of debating the relative merits of centralisation versus decentralisation. NPM advocates favour decentralisation as it often (though not always) equates with smaller, less powerful organisations and because it may promote localisation, bringing public servants closer to those they serve. This, it can be argued, fosters local innovation, responsiveness and employee motivation[10] (Pollitt 2005:372-374,378, Allen 2006).

"Agencification", defined as "transferring as many government activities as possible into agency-type organizations" is an important tool for decentralisers (Pollitt et al

[10] Allen argues that within the NHS empirical evidence is equivocal as to whether decentralisation increases responsiveness beyond certain groups and whether employee morale has been improved.

2004:3). Advocates argue it improves efficiency and management and "place(s) services closer to citizens, reduce(s) political meddling, and enable(s) ministers to concentrate on the big policy issues". Detractors, on the other hand, fear agencies feed public sector fragmentation by stripping out ministries' policy making capacity and becoming larger and more powerful than the departments from which they sprang (pp.3-4). In the UK, 75% of the public sector workforce plies its trade in agencies (p.6), reflecting the degree of decentralisation in its public service. The UK healthcare system is rife with agencification, in bodies such as NHS Pensions, the National Patient Safety Agency, the National Treatment Agency, various regulatory agencies, such as the Medicines and Healthcare Products Regulatory Agency and, of particular relevance to this research, the Health Protection Agency.

Dunleavy et al (2005), however, argue that the UK is belatedly rolling back its extensive agencification program, aided by significant developments in digitization technologies. These authors cite examples of "policy disasters" and how they have led to "re-assimilations of agencies into cohesive departmental groups" (p.481), even within high-NPM states such as the US and the UK. Examples include the creation of the US Department of Homeland Security and the UK Department of Work and Pensions. With the 2010 election of the Coalition government in this UK, the trend toward agencification roll-back has been accelerated.

Despite evidence of agencification losing some of its appeal, it undoubtedly remains popular in many countries. Pollitt et al (2004:13-17) ask (a) why agencies have become so popular with governments and (b) how governments can best steer them to (c) maximise their potential, by enlisting economic, social science, and interpretive/social constructivist theories to answer these questions. Cost efficiency is rarely the sole reason for establishing an agency, and other, often political influences are paramount (including the delegation of blame, as will be discussed below). Agencification may be a fad (p.16), but as to why agencies have become so popular, Pollitt et al concede 'there have been lots of different reasons and in many cases we don't have a very clear idea of which were the most influential' (p.21). With regard to the steering issue, they conclude that governments find it difficult to strike the right balance between "active steering (desirable) and micromanagement (undesirable)" (p.22). Perhaps not surprisingly, "the proposition that turning a function over from a government bureaucracy to an agency *generally* leads to enhanced efficiency is not proven", although there are notable instances where enhancements are clear (p.23). Contra Dunleavy & Hood (2005), one of Pollitt et al's (2004) main conclusions validates the

enduring nature of at least some NPM reforms: "if there is a trend – allowing for some counter examples - it does seem to be in the general direction of more management autonomy and more and more sophisticated performance measurement for disaggregated executive bodies" (p.246).

Decentralisation drives can also result in a "hollowing-out" of policy making capacity within formerly powerful line departments, with previously vertically integrated ministries, such as the Department of Health, disaggregated into separate purchasing and providing functions and silo-like executive agencies (Dunleavy 1995). Once this strategic and policy core is eroded, departments risk becoming unable "to hold their own", or maintain an appropriate balance in the relationship with newly devolved agencies (Pollitt et al 2004). Once lost, such institutional capacity is difficult to recoup. On a more philosophical note, Pollitt (2005:381) contends that disaggregation and the "hollowing-out" of central government departments is inconsistent with the current interest in "joined-up" working in government. In the absence of a centralised co-ordinating or strategic function, (often the consequence of departmental hollowing-out), it is difficult to facilitate and ensure "joined-up" working amongst disparate components in a disaggregated system. As will be discussed later, TB control in London is plagued by the effects of disjointed, non-adaptive work practices across the system, often flowing from just such disaggregation and hollowing-out.

For most of its history, the NHS has been characterised as a blend of centralisation (parliamentary accountability, national funding) and decentralisation (localised decision making and implementation), but the relative balance between the two has often shifted with changes in government, or within the same government (i.e., the Blair government) (Allen 2006). Peckham et al (2005:223), following Butler (1992), observe "it is unclear whether the NHS is a central service that is locally managed or a local service operating within central guidelines."

However, taken in their totality, decentralisation initiatives combined with other NPM programmes, can have the effect of fragmenting public services, including healthcare. Decentralisation also makes it easier for governments to shift blame (Allen 2006; Pollitt 2005:381), and can lead to an "erstwhile anarchy of competing separate initiatives" (Dunleavy et al 2005:482). Diffuse and decentralised systems are complex and ordinary people may find it more difficult to hold government to account for perceived injustices. Allen (2006) (following Powell 1998) observes that devolving

responsibility without power results in the devolution of blame, along with the devolution of service delivery, from higher to ever lower levels of government.

The system responsible for TB control in London can be characterised as highly decentralised, as seen in Chapter Two (with 31 TB clinics amongst the 70-odd components comprising the system) and deeply fragmented, as later chapters will explore in more detail.

NPM and Public Health

NPM principles adopted within the NHS have presented difficulties for the field of public health. Whilst a combination of centralisation-decentralisation could, in theory, be helpful for sound public health practice, it is difficult to strike an appropriate balance. A heavy focus on decentralisation, especially when it results in fragmentation, is the antithesis to the holistic and systemic approach advocated by public health specialists and raises significant concerns regarding the equity of service provision. Increased localism can, and does, lead to an unequal distribution of public goods and services: "Autonomous local services are more prone to inequities – both intentional and unintentional"(Pollitt 2005:381). As mentioned above, decentralisation makes it more difficult for people to understand which public officials should be held to account for injustices when systems are diffuse and complex (Allen 2006).

NPM-inspired "bureau shaping" can also negatively impact public health programmes as "policy elites" may be motivated to promote "welfare reducing privatization" initiatives in order to "reshape public sector organizations into the format which suits" their personal motivations for professional advancement (Dunleavy and Hood 1994:12). Associated costs are often "borne by other less powerful interests, typically...hard-to-serve clients" (p.12). Many of these "hard-to-serve clients" would surely be well represented amongst the ranks of those requiring the most public health intervention, including TB services.

NPM relentlessly focuses on measurement, a concept which, outside of epidemiology, has long been problematic for public health. The effectiveness of many policies cannot easily be evaluated with the quantitatively based auditing and accounting approaches favoured by NPM (Power 1997:51). Bureau-shaping public managers are aided by "accounting frameworks which focus on a narrow range of costs that are readily captured...while ignoring more diffuse costs or changes in service quality which cannot be so easily quantified" (Dunleavy & Hood 1994:12). For instance, calculating cost-

savings generated by ill-health prevention initiatives or health improvement marketing campaigns is notoriously difficult (e.g., the potential savings to the NHS from instituting a universal anti-TB vaccine, or proactively treating latent TB). Consequently, valuable public health initiatives are difficult to justify and vulnerable to elimination in the name of NPM-inspired cost cutting.

Concluding Remarks Regarding NPM

At its root NPM is positivist, reductionist and linear, grounded in the conviction that it is both possible and desirable to control organisational outcomes. And with respect to healthcare, at least, "this omnipotent idea of control remains a fantasy much beloved" of those charged with NHS modernisation (Sarra 2005:181). This belief in linearity and control assumes various guises, owing in part to the differences among the four models of NPM (Ferlie et al 1996), as outlined earlier. But regardless of which form it adopts, the NPM model stands in considerable contrast to the complexity theory model with which it is being compared in this research.

As outlined above, the imposition of NPM values within the NHS, and within the public sector more generally, brings challenges to healthcare providers and members of the public service. But even its detractors, and within academia they are legion, concede that it has also brought some benefits (Diefenbach 2009). These benefits include greater awareness of the concept of value and the need to respect tax payers' money, and more sensitivity to consumer/patient needs. However, "hard", or quantifiable, gains to the system arising from NPM are more nebulous (Pollitt et al 2004:23). Allen (2009) notes that high transaction and contracting costs, combined with a loss of "donated labour" supplied from committed public servants, can largely offset potential cost savings generated by cost cutting, efficiency drives and contracting-out. At the same time, she observes, there is empirical evidence showing some degradation in the quality of public services delivered by private providers particularly "where for profit providers with strong incentives to cut costs are used" (Allen 2009:384).

Researchers have noted inherent contradictions contained within, and nurtured by, NPM:

- Organisational capacity for change along with standardisation and formalisation
- Centralisation (e.g., strategy, policy, budget, information systems) and decentralisation

- More management layers (to accommodate more managers and fragmentation) and claims to eschew hierarchy
- Empowerment as well as "taylorised" processes and surveillance and control systems
- An expectation of entrepreneurial behaviour along with close performance management (Diefenbach 2009).

With respect to the NHS, Allen (2009:386) sums up these incongruities as "an accumulation of contradictory organisational effects, making the NHS both more bureaucratised *and* more marketised".

Towards Operationalising the Research

Deriving the professional dominance and NPM concepts used in this research from the literature

As with complexity theory, there are no universally accepted definitions of either professional dominance or NPM. Consequently, in order to collect empirical evidence it was necessary to identify concepts particular to each of the theories which could be observed (or identified) during data collection. The section below identifies five such precepts from each of the theories of professional dominance and NPM which appear widely in the literatures, and are largely uncontested. These concepts are considered particularly relevant to the study of the NHS generally and London's TB control system in particular.

The five aspects of the theory of professional dominance operationalised in this research are:

1. Autonomy, or occupational self-direction and standard-setting, based on superior authority and complex knowledge of subject (Freidson 1970). This autonomy is granted and guaranteed by both the legal system and social contract, and underlies professions' abilities to self-regulate (Barnett et al 1998, Hafferty & Light 1995, Light et al 1986, Wolinsky 1988)
2. Control over the work of others in the same domain (Freidson 1970:130-132), indicating a power imbalance and inferring the presence of at least some hierarchy (Light et al 1986)

3. Social and cultural deference to professionals, in this case, physicians. (Interestingly, while culture is "fundamental" to deference, authors note that deference could quite easily morph into wariness, making this feature less concrete and certain than others in the model [Light et al 1986].)
4. Authority and hierarchy - where professionals (physicians) do take orders, it is from other professionals (physicians) (Freidson 1985)
5. Control over resource allocation (Barnett et al 1998, Light & Levine 1986)

The five aspects of NPM which have been surfaced from the literature review and for which evidence has been sought empirically are:

1. "Managerialism" whereby managers assume greater influence and become more directive, often using targets and performance management tools. (Ferlie et al 1996:11,108,182-183, Diefenbach 2009)
2. Quasi-markets which are introduced with the any or all of the following results: markets, not planning, are used to allocate resources; contracts replace hierarchies as the basis of relationships; and line departments are disaggregated into purchasing and providing functions or arms-length agencies, with a resulting erosion of policy making capacity and/or agencification. (McNulty & Ferlie 2002:56, Dunleavy 1995,Allen 2009)
3. Focus on measurement, risk management and control. (McNulty & Ferlie 2002:66-57, Moran 2003:153)
4. Enhanced focus on the "rights" and role of the "consumer", i.e., greater patient involvement. (McNulty & Ferlie 2002:57-58)
5. Pressure for reform originating from the top and pushed downward with persistence and in a staged manner.(Ferlie et al 1996:10-14, Diefenbach 2009)

Methodological challenges associated with this research are defined in the next chapter. However, based on the review of the literature, and the ten features of professional dominance and NPM of interest, as defined above, ways in which these elements might be explored are here suggested.

Professional Dominance

- *Autonomy*: Do consultants treating TB act in a self-directed manner? Do they collaborate with others?
- *Control*: Within multidisciplinary treatment teams who exercises ultimate control and decision-making within the clinic?

- *Deference*: During meetings and other encounters, do non-physicians demonstrate deference toward consultants, and do these physicians dominate meetings and other encounters?
- *Authority*: Despite an acknowledged increase in the role and power of managers within the NHS, who makes final decisions and how is authority exercised?
- *Resource Control*: Who controls the allocation of resources?

NPM

- *Managerialism*: Do managers exercise significant influence and control over the way in which the TB control system functions, including over-ruling TB consultants?
- *Quasi-markets*: Is there a rigorous contracting function in place between the purchasers and providers of TB services? Is there evidence of new agencies operating within the TB control system? Contracting out?
- *Control and Measurement*: Are there defined performance measures and targets in place for TB service providers and managers? Are sanctions imposed if targets are not met?
- *Consumerism*: Do current and former TB patients, or their advocates, play a significant role within London's TB control system?

Top-down pressure: Is senior NHS London and/or the Department of Health management active within London's TB control system, pushing for reform and improvement?

Having provided a critical overview of the two alternative theories to complexity theory applied retroductively in this research, the remainder of the chapter will discuss Kingdon's (1995) theory on public policy development and agenda setting. This theory and related literature is introduced in response to the major inductive finding of this research – the low policy priority accorded to TB control in London – and will be revisited in Chapter Eight to facilitate a theorisation of this finding.

Kingdon's (1995) Theory on Public Policy Development

Kingdon (1995) helps to conceptualise the scant interest in TB control in London in the midst of a resurgence of the disease, as will be shown in Chapter Eight . His model seeks "to understand why some subjects become prominent on the policy agenda, and

others do not" (p.3). Kingdon concludes that three separate streams - problems, policies, and politics - must develop and then come together for public policy to be made and enacted (p.85). Each of these streams is described briefly, below.

Kingdon's Problems, Policies and Politics

Problems

Kingdon distinguishes "problems" from "conditions", claiming "(c)onditions become defined as problems when we come to believe that we should do something about them" (p.109). He observes that problems are often identified in various ways, such as via routine monitoring by government officials, particularly when this monitoring indicates change from the previous state (pp.90-92). However, these indicators are subject to interpretation, including whether a crisis has occurred and, more generally, policy actors' pre-existing notions, and what is "in the back of (their) minds" (pp.92-95). Ongoing feedback (monitoring, complaints and casework) from existing programs is another source of information when considering whether a condition should be "upgraded" to a problem. Activists, or lobbyists, may also contribute insights (p.115). *How*, in addition to *whether*, a problem is defined, impacts the policy response. For example, if high costs are defined as the key problem in healthcare, "attention to more costly initiatives is dampened, and all present and proposed activities are scrutinized according to...cost" (p.115).

Another consideration in defining a problem is the *category* into which a condition is placed. "People will see a problem quite differently if it is put into one category rather than another" (p.111), Kingdon argues. This is a particularly salient point for TB control. Kingdon observes "(t)here are great political stakes in problem definition" (p.110). These stakes, it is argued here, extend beyond the policy problem to the impact on individual policy makers.

Policies

Kingdon describes the world of policy formation as akin to natural selection, using the metaphor of a "primeval soup". Ideas are like primordial molecules, with some more viable than others; some "bump into" and confront each other, sometimes combining to create something new and different (pp.116-117). The source of policy "molecules" is a policy community which operates largely outside of political events. The members of various policy communities may be tight-knit, or fragmented, meaning the policy options generated from within a community range from a coherent to a conflicting array of ideas on the same topic (pp.121-123). Whilst acknowledging that power and

influence play a role in developing policy alternatives, Kingdon focuses on the ideas themselves, stressing the importance of content and the intellectual exercise of debate and exchange which leads to policy alternatives being formed (pp.124-127). If a policy proposal is to emerge from the primeval soup, it must meet certain criteria, including technical feasibility, providing decent value, and being saleable to the public and politicians (pp.131-138). A short-list of alternatives eventually rises to the top of the primeval soup pot, with one idea gradually gaining prominence and support. The importance of identifying a solid, widely agreed alternative is key to ensuring policy change (p.142).

Politics

Kingdon's political stream refers to "such things as public mood, pressure group campaigns, election results...and changes in administration" (p.145). The national climate determines whether the ground is fertile enough for a particular seed of an idea to germinate, or whether a policy community should wait before actively pursuing an idea. As the public mood is cyclical, there is an acceptance that most ideas' time will eventually come (pp.147-149). Kingdon assumes weak structural influence from the broader system and, writing from a US perspective, emphasises the role of pressure groups and lobbyists in mustering support and mobilising the vote in favour of specific policies (pp.150-153). UK parallels include the medical profession and patient groups (Klein 2010:40,273). The most obvious components of the political stream are elected officials and their staffs, and a change of administration is a powerful means of changing policy agendas – adding new ideas, dropping others.

Joining the Streams Together

Whilst the streams described above develop and function independently of each other, at some point they must come together for a policy alternative to advance and become enacted. This happens when a "policy window" opens: "(a) problem is recognized, a solution is developed and available in the policy community, a political change makes it the right time for policy change, and potential constraints are not severe" (Kingdon 1995, p.165). Such windows usually open after a change in government or crisis (pp.166-168). A policy alternative's time to shine is a short one, so the alternative needs to be fully developed and ready once the elusive policy window opens.

Population Level Considerations

Dievler and Pappas (1999) analysed the policy response to the HIV/AIDS and TB epidemics in Washington, DC in the early 1990s using Kingdon's model. Their study was undertaken at the population level, examining the impact of race and social class on the policy response to TB. The TB situation in DC was remarkably similar to London's today, as the District battled a surprise resurgence of the disease. As in London, the authors note that TB was "confined to certain 'places', that is, among the homeless on the streets or among those locked away" (p.1100). Further, the responses of the two cities were almost identical. In DC,

> *the problem of TB never fully got on the government's agenda and many of the solutions that were developed and implemented were either inappropriate or unsuccessful...The bureaucracy responded defensively...creating a task force to develop a plan, meanwhile ignoring previously developed planning documents that were available and adequate to begin action.* (pp.1098-1099).

In DC as in London, it seems there was action but little change or improvement. Dievler and Pappas conclude (p.1095), "Social class considerations and racial politics shaped what policies were developed or not developed and implemented successfully or failed."

The Importance of Political Commitment

Political commitment is a vital component in good TB control. Broekmans et al (2002), writing with regard to TB control in countries with a low incidence observe "essential elements of the WHO recommended strategy of tuberculosis control...are political commitment to tuberculosis control" (p.765) and

> *(e)fficient tuberculosis control and ultimate elimination will not be possible without government commitment...demonstrated by: provision of the necessary basic infrastructure (in terms of funding, human resources and facilities) (and) effective technical leadership at a national level"* (p.770).

Discussing the deep political commitment within New York City to its programme of TB control, Coker et al (2004) note "(w)ithout the skills, advocacy and commitment" of various senior level city officials, including the Commissioner of Health, "it is unlikely the programme would have achieved as much as it did." The authors continue: "whilst the publication of quantitative data...is common in peer-reviewed journals, the narrative exploration of other important factors, including the political, that might be important in ensuring success receive less attention. Yet...political commitment is

important in programme success." Coker et al (p.222) conclude, "Whilst in New York City it is clear who is responsible for tuberculosis control, the same still cannot be said, 15 years after the rates of tuberculosis started to climb, for London."[11]

A well rehearsed claim in public health circles, attributed to former New York City Health Department official Hermann M. Biggs in 1905, is that a "city can have as much reduction of preventable disease as it wishes to pay for. Public health is purchasable: within natural limitations a city can determine its own death rate." Coker (1998:616) observes, "(t)he sentiments are as true today...it just depends on how much we are prepared to spend and how. Political will needs to be allied to a political and public health mandate."

Relatedly, Kingdon offers an important observation regarding whether a policy idea takes hold: "If the costs of paying attention are too high, otherwise worthy items are prevented from becoming prominent...if an unacceptable political cost would have to be paid, the item is shunted aside" (p.88). As shown later, this point is highly relevant to understanding TB control in London.

Parallels Between Kingdon's (1995)Model and Complexity Theory In his book's post-conclusion, entitled "Some Further Reflections" Kingdon (1995:223-224) briefly discusses the "parallels" between complexity theory and his theory, citing three similarities:

1. Both find pattern and structure in complicated, dynamic and unpredictable phenomena (e.g., the "simple rules" concept discussed earlier), with these structures emerging locally, "rather than being imposed from on high"(e.g., self-organisation)
2. A "residual randomness" remains even after the above structures are identified, "so that there is surprise and unpredictability", and non-linearity between cause and effect
3. Both models "are historically contingent" and initial conditions matter in determining how a system develops and changes

These observations appear again in the updated, 2011 edition of Kingdon's book, but, interestingly, the author did not further develop them. Various public management and public policy scholars writing from a complexity theory perspective cite Kingdon's model, but this research could locate only two papers which attempt to build on Kingdon's observations regarding similarities with complexity theory, and both do so

[11] Nor, indeed, 24 years later, in 2012.

only briefly. Eppel (2009) likens Kingdon's multiple streams model to a whole system, but her development of Kingdon's theory from a complexity perspective is brief and non-empirical. Rhodes & Murray (2007) examine, empirically, a decision-making process within the Irish public housing sector from a "complex adaptive systems" perspective and Kingdon's (1995) theory is introduced. But it is not used vis a vis the complexity theory sections of the paper nor in the discussion. Rather, it is narrowly applied and contrasted to the research's own observed process of decision making, i.e., outside the complexity theory aspects of the paper. In Chapter Eight this research develops and elaborates upon the synergies between complexity theory and Kingdon's theory, resulting in one of the major theoretical contributions of this thesis..

Concluding Remarks

This chapter has reviewed the literatures relevant to the professional dominance and NPM frameworks, both of which are used as competing explanatory models to complexity theory in this research. Key components of professional dominance and NPM were highlighted, with areas of contest within each literature discussed. The chapter concluded by identifying the five "signs and symptoms" from within the professional dominance and NPM models which will be operationalised in the research. Kingdon's (1995) theory on public policy development was also introduced and discussed, as it is used later to provide theoretical elaboration on the key inductive finding of this research; namely, the low policy priority accorded to TB control in London. The next chapter builds on the discussion in this, and the preceding, literature review chapter by discussing research paradigms, research strategies and research methods as they pertain to this thesis.

CHAPTER FIVE: RESEARCH METHODOLOGY

Introduction

This chapter describes the research philosophy, strategy and methods used in this study. It opens with a discussion on the various research paradigms available to social scientists, and then describes and defends the one ultimately chosen for this research. A researcher's choice of research philosophy, or paradigm, is a vital consideration as it impacts subsequent decisions regarding research strategy, design and methodology, although the extent of this influence is contested and multi-strategy research is increasingly common (Henn et al 2006:18-22). After discussing research philosophies, the discussion turns to the research strategy, design, methodology and methods used in this study. It then shifts to a focus on the specific data collection methods and analyses used, including the limitations, challenges and other issues confronted during the course of the research. The chapter concludes with a brief discussion on ethics and how ethical concerns were addressed.

Research Paradigms: Choices and Approach

Ontology is concerned with "notions about the world" and is an area of philosophy "which indicates the necessary features of which exists" (Danermark et al 2002:206). Ontology, or assumptions about the nature of the world, and epistemology, or assumptions about the nature of knowledge (Henn et al 2006:18) have tended to shape the methodologies which researchers use. Those who assume that objective reality exists and is "knowable" tend to rely on approaches grounded in the "scientific method" and quantitative approaches to "measure" aspects of this reality. In contrast, those who assume that reality is socially constructed and that knowledge is always subjective tend to rely on qualitative methods. This will be discussed in more detail below. Another dimension to the research paradigm choice surrounds the goals of the researcher. Burrell and Morgan (1979), for example, differentiate approaches aimed at measuring or exploring the status quo in contrast to those aiming to effect change. In general,

"critical" approaches, regardless of their prevailing assumptions about the nature of reality and our ability to know it, have a change-oriented or emancipatory agenda. Some critical researchers focus on structural change (like Marxists and Radical Feminists), and others on the agency of individuals, typical of more "liberal" approaches (Klein 1999).

As scholars have noted, there are increasingly blurred boundaries between the major paradigms and perspectives (Denzin & Lincoln 2005:183, Henn et al 2006:10), of which the emergence and growing acceptance of critical realism may provide further evidence. Critical realism is characterised by some as a middle-ground between objectivism/naive realism and subjectivism/relativism (Guba 1990:19-27). The section below explains why critical realism is an appropriate approach to the study of complexity theory

Objectivism and Positivism

Objectivists believe in the existence of an independent, immutable reality "out there". Consequently, their study of this reality is well-supported by, and usually focuses on, measuring, counting, modelling and otherwise manipulating their collected observations. In general, positivists apply quantitative research methods. At its core, the function of positivist scientific inquiry is to establish and isolate laws of cause and effect. This, in turn, facilitates prediction within the object of study (Reed 1992:292). These causal laws are seen as essentially linear, even if they may involve multiple, and even disparate, variables. In an organisational context, identifying these laws, always via the scientific method, is seen as the means of securing control and engineering change within an organisation (Donaldson 1985). This focus on predictability is an especially difficult position to reconcile with complexity theory, as complexity science owes its very existence to dissatisfaction amongst scientists, especially social scientists, with their ability to isolate causal effects using traditional, positivist approaches. Positivists take a deterministic view of causality and, regarding organisation theory, downplay the significance of human choice within organisations (Donaldson 1997). This is at odds with the view held by complexity theorists who see behaviour within complex organisations as emergent and inherently unpredictable beyond the short-term

Even when choice is exercised, the positivist argument goes, actors are not really choosing freely, as they are severely constrained by various organisational realities and

pressures. Organisations are seen as rational instruments of co-ordination and control, encompassing various environmental and functional necessities (Reed 1992:260).

In contrast, complexity theorists believe that behaviour within organisations is emergent and unpredictable beyond the short-term. Human choice, agency, and reflexivity shape the functioning of organisations, particularly at the micro, or local level, where most self-organisation is thought to occur.

Positivists maintain that the objective of social science is to study society scientifically and see measurement, sampling, statistical correlations and other tools of the scientific method as the only valid means of generating true knowledge (Brurell & Morgan 1979:7, Donaldson 1985, Reed 1992:257, Klein & Myers 1999). However, positivism struggles to accommodate the subjectivity inherent in the scientific endeavour arising from the role of the scientist as creator and interpreter, and the notion that it will always be impossible to separate "facts" and the words and used to describe them (Wicks 1998).

With regard to positivism's relationship with theory, positivist research is more often focused on theory testing, rather than theory generation, although the latter does occur (Henn et al 2006:14). Since prediction is highly valued in the positivist tradition, researchers most often deductively test models or hypotheses using quantitatively focused research methods in their efforts to falsify existing theory. Henn et al (2006:52) refer to this as the "theory-then-research" approach.

Clearly there are aspects of the study of organisations which lend themselves to measurement and other quantitative approaches - financial performance, productivity levels and wages settlements, for example. But organisational positivists argue that other phenomena, such as the distribution of organisational power, the effects of organisational structure, and authority, should also be captured quantitatively and can be studied in terms of independent and dependent variables (Pugh et al 1968, Donaldson 1985, and Hinings & Greewood 1988). Donaldson suggests quantitative studies could benefit from incorporating some qualitative elements, such as adding "select personality variables" to the other independent variables, in, for example, the study of organisational power distribution. The author does not suggest how this exercise might be approached, perhaps because qualitative research does not generally use variables. By breaking organisational functioning down into discrete variables, positivist research struggles with understanding and explaining how the organisational

system works as a whole. Easton (2010:120) observes that "(v)ariables are measures of things and not the things themselves" and they tell us nothing about the causes of the change which the variables may be designed to reflect.

For positivists, if it cannot be measured, it is not important to our understanding. Such a reductionist effort highlights a significant shortcoming of applying the "scientific method" to organisation theory: "the confusion between a pedagogical device – the device of summarizing the upshot of one's narrative in pithy little formulae – and a method for discerning truth" (Rorty 1985:2). Godfrey and Hill (1995:531) refer to this as "the scientistic error" in that it "equates measurability of a construct with its relevance in explanation." This sort of thinking is highlighted by Power (1997:51) when he discusses the NPM-inspired practice of designing "organizations...to make them auditable", as highlighted in the previous chapter.

Positivists remain troubled by the notion of unobservables, accepting Flew's caution against "attempts ...to go beyond...observation in order to inquire into first causes and ultimate ends", accepting a distinction between finding reality, and making or interpreting it (quoted in Wicks & Freeman 1998:125). The puzzles of complexity theory, on the other hand, arise largely as a result of "generative mechanisms" (Bhaskar 1975:49), which can be either exercised or latent and are often initially hidden to the scientist. Amongst other things, these mechanisms may be responsible for some of the non-linear and self-organising behaviours observed in systems, both of which are important considerations for complexity theorists who study organisations. For their part, positivists respond to the challenge of understanding these behaviours by engaging in reductionist efforts, as discussed in Chapter Three, in the belief that an increasingly fine-grained understanding of a system will eventually explain unexpected or puzzling results. This research takes the position that the study of complex organisational systems requires ontological and epistemological approaches which accept, without hesitation, the existence and importance of unobservable structures and mechanisms, of the sort Bhaskar refers to above. Positivism, despite its long and successful history within the physical sciences, is not able to offer this to a complexity theorist's study of organisations. Nonetheless, even in the pure sciences, recent discoveries, particularly within particle and quantum physics, have forced a move from strict logical positivism to a more moderate instrumental positivism which accepts the presence of some unobservable elements (Godfrey and Hill 1995). In sum, then, perhaps positivism is not so much inconsistent with complexity theory research as it is insufficient.

Subjectivism and Interpretivism

By the late 1800's, an anti-positivist movement had emerged, centred in Germany and led by Max Weber, Wilhelm Dilthey and Edmund Husserl. However, this early movement "did not carry the day" and the "procedures and logic of the physical sciences" prevailed in the study of "the human realm" (Polkinghorne 1983:20). It was not until the 1970's that subjectivism came into its own in the social sciences. This early anti-positivist approach developed in response to disquiet with positivism's capacity to generate knowledge of both the "sphere of reality that exists because of human beings" and of the meaningful experiences which human beings generate (Polkinghorne 1983:21). Rather than striving for what was seen as an unobtainable objectivity on the part of the scientist observer, anti-positivists believed human experience and subjectivity should be confronted and should inform the object of study (Orlikowski & Baroudi 1991). As previously noted, this notion of whether there exists a hard, objective reality "out there" or whether reality is a subjective social construction is the key distinction between a positivist approach and an anti-positivist, interpretivist approach.

Interpretivists contend that researchers act as participants rather than mere observers during the process of knowledge generation and that value-neutral observations are not possible. They contend that language is a pre-condition of the facts which we use to describe and interpret reality, although not necessarily of the entity or reality itself (Fleetwood 2005). Interpretivists argue against the existence of social structures outside of the mental models which they believe create them (Burrell and Morgan 1979:28-32, Fleetwood 2005). "From the standpoint of the interpretivist paradigm, organisations simply do not exist" (Burrell and Morgan 1979:260). Nonetheless, interpretivists are amongst those scholars most actively studying organisations (Mintzberg & Waters 1982, Bennett & Ferlie 1994).

In contrast to positivism, with its conviction that observed patterns of the past will repeat themselves, interpretivist researchers believe in placing the object of study in its historical and social context to show the important role these contexts play in creating the current situation (Fleetwood 2005, Klein & Myers 1999). This belief in the value of context over predictability naturally points to an acceptance of dynamism within systems, an important aspect of complexity theory. A key component of this dynamism is the interaction between and among the people and events which comprise social systems. These relationships are ever-changing, based on shared norms and interests,

and have a two-way, dialectical effect on the system and its components (Orlikowski 1991). People change the system and are in turn changed by it. Since the study of complex systems is largely the study of relationships, the utility of an interpretivist perspective is clear.

The "hermeneutics of suspicion", a key element in the work of critical social theorists such as Jürgen Habermas and Michel Foucault, is also consistent with some research taking a complexity theory perspective. Critical theorists question how certain social constructions are used to promote favoured options and outcomes and aim to understand phenomena such as power dynamics and vested interests (Klein 1999). Engaging in such questioning has emancipatory potential. Even if it is not an objective of most complexity theory research, the value of empowerment, of understanding the impact of relationships, and of enhancing social equality is evident in the work of some complexity researchers (Levin 2002), including those studying the public and social enterprise sectors (Houchin & MacLean 2005, Rhodes & Donnelly-Cox 2008), and scholars analysing culture as a complex adaptive system (Boisot 1999). In this regard, again, an interpretivist approach is consistent with some complexity theory research.

Interpretivists view causality as arising from so many factors in each and every event that it is impossible to determine the roles played by any of them, meaning "they can only provide their own interpretation" (Easton 2010:118). They contend that "events are determined by potentially infinite causalities...and..any explanatory power derived from this approach is inescapably partial" (Mir & Watson 2001:1172). As noted earlier, complexity theorists, whilst rejecting linearity in cause and effect, believe in causality, often arising from some form of self-organisation. Consequently, adopting a research approach which supports the notion of causality is important here. This study's objective of elucidating the structures and mechanisms at play within complex systems involves explaining the potential causal factors within these systems. Consequently, interpretivism's position on causality does not offer a strong platform for meeting this research objective. This weakness is underscored by what Fleetwood says are interpretivism's "emaciated" explanations, arising from its tendency of "downgrading extra-discursive entities", resulting in an "impoverished" ontology (Fleetwood 2005:214).

With respect to its relationship with theory, and in contrast to positivism, interpretivism adopts an inductive "research-then-theory" approach and is focused on theory generation, rather than theory testing (Henn et al 2006:53). Since prediction is

not a priority, and since interpretivists are interested in understanding aspects of human behaviour which are not readily measured (Henn et al 2006:16), qualitative research methods are the preferred tool of the interpretivist researcher, although quantitative methods are sometimes used.

So despite some clear aspects of utility, interpretivism on its own is not sufficient to meet the needs of this complexity theory study. Since interpretivists argue "there is no reality to be discovered" (Easton 2000:215), or that what is called reality is purely a social construct (Easton 2000:207), the study of causality, so important to complexity theory research, becomes extremely difficult. On the other hand, positivism's embrace of linearity, focus on measurement, and discomfort with unobservable structures and mechanisms, rendered it ultimately insufficient for this study, too. Critical realism, as argued below, fills these gaps and provides an ontological platform (recognising that reality exists) along with an epistemology (our understanding of reality is subject to historical and other influences) appropriate for this research.

Critical Realism

The foregoing discussion illustrates why positivism and interpretivism both fall short in offering a sufficiently robust ontological and epistemological platform for complexity theory research, particularly in the study of a large, organisational system. Critical realism is an approach which fills the identified gaps, offering complexity theorists working in the social sciences a strong philosophical grounding for their research, in some respects combining the ontology of positivism with the epistemology of interpretivism. Critical realism on the one hand assumes that reality exists independently of our representation of it, but also acknowledges that our knowledge of it is shaped by historical and other influences (Reed 2001, Blaikie 2007, Bhaskar 1975, Sayer 2000).

Critical realism can trace its origins to the work of Aristotle, although modern critical realism is seen to have emerged first through the writings of American Maurice Mandelbaum in the mid-1950s. But it is the work of British philosopher Roy Bhaskar which has inspired much of the significant and growing interest in the field over the past three decades (Hatch 2006:329). Bhaskar's initial efforts focused on developing what he alternately termed "transcendental realism" and "scientific realism". His objective was to provide an alternative to the significant limitations he sees inherent in empiricism/positivism, rationalism and constructivism as approaches for

understanding the natural sciences (Bhaskar 1975). In 1979 Bhaskar extended this argument to cover the human sciences by writing *The Possibility of Naturalism*, his attempt to address what he saw as "the social scientific malaise" (p.25).

Bhaskar's work has been described as a program of "modest objectivism" (Reed 2001:222, quoting Layder 1997), and Blaikie describes critical realism as "a middle way between Positivism and Hermeneutics" (2007:147). Danermark et al (2002:202) refer to critical realism as a "third way", but stress that it is "not a conflation of, or compromise between" objectivism/positivism and subjectivism/interpretivism. For example, Bhaskar argues that objects like the mechanism of natural selection and the specific gravity of mercury would exist even if we did not know about them. He combines this perspective with a view of knowledge and science as being socially produced, iterative and antecedent (Bhaskar 1975:60-62). Critical realism is concerned with two "objects of knowledge": the "transitive" (the theories, facts, models and paradigms that we develop) and the "intransitive" (the world which we are studying, including its mechanisms and structures, which exists independently of our study of it). Transitive knowledge is used to understand intransitive objects (Bhaskar 1979:14).

Bhaskar (1975) develops some important and useful arguments and devices for organisation theorists and complexity theorists alike, particularly those with an interest in critical perspectives. These include:

- a view of causality that acknowledges its often non-linear nature in open systems;
- a description of reality in which social systems exist in three levels: empirical (observable), actual (expressed but not necessarily observable), and real (where events actually happen, where the structures and mechanisms of our world lie); and,
- a contention that social systems are hierarchical and nested, with discursive activity occurring among the levels.

Critical Realism as a Means of Explaining Generative Mechanisms, Causality and Non-linearity

Critical realism is concerned with identifying and examining persistent relationships and the relations between these relations (Bhaskar 1979:36). Contrary to positivism, it offers a means of explaining the dynamics of change by arguing that objects and phenomena can be studied by means other than direct observation (Bhaskar 1975:45-

46). Danermark et al (2002:203) observe, "Where empirical research finds a 'flat' reality, reducible to events that can be observed, critical realism sees a deep dimension, comprising the mechanisms that produce events in the world". Realism, including critical realism, argues for a fundamental shift in how we evaluate scientific criteria, "away from the search for truth and toward the search for adequate explanation" (Godfrey & Hill 1995:524). Unobservable objects of interest include the generative mechanisms which cause change, and these mechanisms are characterised by "tendencies", as opposed to "laws" (Bhaskar 1975:50). As they do not involve strict laws of cause and effect in the positivist sense, generative mechanisms do not facilitate prediction, or at least not beyond the short term. However, by helping scientists understand their object of study, these generative mechanisms do provide a means of potential emancipation for members of systems. This result arises when researchers demonstrate certain societal understandings to be false, thereby revealing as questionable the outcomes which these understandings produce (Bhaskar 1979:32).

Understanding the role of generative mechanisms within natural and social systems is important. In fact, the primacy given by critical realists to identifying mechanisms is the major distinguishing feature between critical realists and interpretivists, with the latter focused on identifying meaning in social action and social artefacts. Surfacing the generative mechanisms within a system requires looking beyond the "constant conjunction of events" (Tsang & Kwan 1999:762) which produces some sort of pattern to discover what actually *causes* the regularity. As Sayer observes, "What causes something to happen has nothing to do with the number of times we have observed it happening" (Sayer 2000:14). Researchers working from a critical realism perspective have sought to identify generative mechanisms in fields as varied as organisational studies (Reed 1992, 2001), management (Fleetwood 2005), marketing (Easton 2010), crime (Pawson & Tilley 1997), geography (Byrne 1998), regional economic development (Chiles 2004), and higher education (Sayer 2000).

Within healthcare research, the widespread use of Pawson & Tilley's (1997) evaluation model speaks to the perceived value and applicability of critical realism in that field. Pawson & Tilley's work is firmly grounded in critical realism, and focuses on the importance of context and of identifying mechanisms during evaluative studies which typically seek to move beyond interpretations of the organisational context to assess programme effects. Healthcare studies using this model include an insightful study into TB control by Atun et al (2004), a study of the NHS national bookings services (Ham et

al 2003), and an evaluation of a £21 million healthcare modernisation initiative in London (Greenhalgh et al 2009)[12]. Wilson & MacCormack argue that critical realism should inform future clinical practice development evaluations (2006) and Hanly (1995) discusses the merits of a critical realist approach in informing the field of psychoanalysis.

Critical realists and complexity theorists both accept causality as important and spend considerable effort trying to identify causal factors. They do not, however, accept that causality is either linear or predictable. Rather than joining the positivist search for immutable laws to explain cause and effect, they seek to identify general tendencies (Danermark et al 2002:74). Critical realists emphasise the importance of both context and the enabling and constraining factors which act on events (Sayer 2000:15; Pawson & Tilley 1997:58, 69; Byrne 1998:113; Fleetwood 2005). This focus on context is another reason why a critical realist perspective is well suited to this research and to complexity theory research generally. By incorporating a degree of constructivism in their analyses, critical realists accept that there will always be a "difference between our descriptions of reality and the reality that is described", and that these descriptions are derived historically and culturally, whilst accepting that "this does not mean that the nature of the things known would be different" (Hughes & Sharrock 1997:165).

Critical realist inquiry aims to explain the absence of linear causality and to validate the often non-physical nature of causality. This is not an exercise in simply identifying intervening variables or deciding whether the relationship between variables is direct or indirect. Rather, the task involves developing a theory regarding why the processes at play behave and interact the way they do to produce the regularity in question (Pawson & Tilley 1997:67-68). In developing causal explanations, a critical realist distinguishes between what must happen and what could happen (Sayer 2000:27). The researcher identifies how "X" is possible and "what properties must exist for X to be what X is" (Danermark et al 2002:110). Further, these explanations characterize causal mechanisms and structures in terms of their systems of relations and the relationships which comprise them (Reed 2001), an important component of complexity theory research. Coming to know these mechanisms is "the arduous task of science", and depends upon a combination of "intellectual, practico-technical and perceptual skills" (Bhaskar 1975:47).

[12] Although, as noted by Greenhalgh et al (2009:412), "identifying the mechanisms of change for different activities in a large-scale modernization effort was far more difficult than Pawson's widely cited textbook implies".

The manner in which these generative mechanisms exercise their causal tendencies is a highly contingent and contextual affair and may result in any number of outcomes. Further, these tendencies may or may not be expressed or visible (Sayer 2000:12, Bhaskar 1975:45-46). Because of this, critical realism is a particularly applicable program for research involving potential non-linear causality. It is the job of the researcher working within the critical realism paradigm to parse out which of the properties and mechanisms are key to an object's existence and which are not. For this reason, predictability is not seen as possible, but explanation is. Critical realism recognizes "that what has happened or been known to have happened does not exhaust what could happen or have happened" (Sayer 2000:12).

Agency and Structure in the Critical Realism Program

Generative mechanisms provide a means of explaining human agency. Owing to its ontological basis in both objectivism and subjectivism/constructivism, or its focus on transitive and intransitive objects of knowledge, critical realism takes an even-handed approach to the agency-structure debate. Whilst post-modernist constructivists reject the duality of agency and structure (Fleetwood 2005), vitally, critical realism steadfastly refuses to collapse agency and structure into one element. Rather, critical realists maintain that actions presuppose existing structures, which are themselves the result of prior actions (Sayer 2000:18). Structures do not exist independently of the activities which comprise them (Reed & Harvey 1992). Structures are "causally efficacious" when it comes to their impact on actors and their actions – they both enable and constrain. It is for this reason that the outputs of some generative mechanisms are neutralized or unobservable, despite the generative mechanism having performed as usual. For example, a healthy, able person has the capacity to work whether she is currently employed or idle. She could become employed or remain idle owing to any number of enabling or constraining events acting upon the current "structure" of her unemployment (Sayer 2000:11-12).

The combination of critical realism plus complexity theory acknowledges the importance of human agency in potentially disturbing the generative mechanisms within systems. It is at the heart of the argument that, in some circumstances, we can intervene in systems to achieve desired outcomes (Byrne 1998:118). This reveals the emancipatory potential of the critical realism paradigm, as discussed earlier, and contributes to critical realists being "critical", rather than just being "realists" or "scientific realists". Unlike positivism, critical realism does not claim to be a value-

neutral "scientific" paradigm. "When we lay bare the generative mechanisms at the social level, we thereby also explain social phenomena in terms of social causes. These are produced by people and can be changed by people" (Danermark 2002:201). In terms of TB control in London, an example of the emancipatory potential of critical realism is that by revealing the mechanisms responsible for keeping TB as a low healthcare priority, it becomes possible to take steps to address this situation.

Recognising the importance of human agency also means the critical realism program is well positioned to support analyses of how novelty and change arise within complex systems (Reed and Harvey 1992, Byrne 1998). Change, or the generation of novelty, is explainable because it is not necessary to directly observe the generative mechanisms responsible for causing the change or novelty (Bhaskar 1975:46). For critical realists and complexity theorists alike, agency is central in determining problems, their components and the rules which define them.

Critical Realism and Its Methodological Alignment with Complexity Theory

Social scientists Michael Reed and David Harvey were amongst the first to propose that Bhaskar's work in "transcendental realism", as the critical realism program was once known, was a natural complement for what they termed a new science of "dissipative systems" - soon to become widely known as "complexity theory" (Reed& Harvey 1992:354). They saw the merger of Bhaskar's philosophical ontology of transcendental/critical realism with the scientific ontology of "dissipative systems" as giving rise to a new meta-theoretical perspective and providing a much needed and useful tool for social scientists. Byrne (1988), whose work on complexity theory and tuberculosis informs this research, endorses Reed and Harvey's arguments regarding the compatibility of complexity theory and critical realism, stating that it "informs" his complexity theory research, too (Byrne 1998:64). Fuller and Moran (2001) espouse a similar position, and the argument for a meta-theoretical approach as envisaged by Reed and Harvey (1992) is put forward again, 15 years later, by Blaikie (2007:210-212).

Despite the cautious approach adopted by conventional social science toward critical realism, I believe it provides the most suitable research paradigm for this thesis. The following five points summarise the main reasons, based on the foregoing discussion, for this choice:

1. it focuses on identifying and understanding the role of generative mechanisms in observed social phenomena (Bhaskar 1975, Danermark et al 2002);
2. scholars have defended its high applicability to the analysis of complex organisational systems (Reed & Harvey 1992, Byrne 1998);
3. it emphasises the vital role played by the broader context of which the observed phenomena are a part (i.e., the wider social and organisational environments) (Sayer 2000, Byrne 1998, Fleetwood 2005, Pawson & Tilley 1997);
4. it is indifferent to the number of units or entities involved in the study (Easton 2010); and,
5. it supports research in which there are relatively objective outcomes; in this study the number of TB cases, for instance. (i.e., real people get real TB and it is not just a social construction.)

These features make the paradigm particularly suitable for answering the questions posed by this research (as detailed in the next section), are useful for understanding and explaining the impact of complexity theory features like self-organisation, historicity and non-linear causality, and for understanding the role of unobservable structures and mechanisms. And finally, critical realism, with its systemic focus, is compatible with the case study method and its approach to knowledge generation (Tsoukas 1998, Byrne 2005), as discussed later in this chapter.

Having discussed issues surrounding research paradigms and the choice of critical realism for this study, the chapter now moves on to discuss, first, the research questions which guide this thesis, and then the specifics of the research strategy and research method used.

Research Questions

A starting point for research design is the formulation of questions including "what?", "why?" and "how?" The first – "what? – addresses a "detailed account...and reporting of the characteristics of some population, group or phenomenon, including establishing regularities" (Blaikie 2000:72). This research tries to understand the nature of the organisational response to TB in London and the role of complexity theory in facilitating this understanding. The second - "why" – "establishes the elements, factors or mechanisms that are responsible for producing the state of, or regularities in, a social phenomenon" (Blaikie 2000:72). Here the "why" questions focus on establishing the mechanisms underlying the organisational response, determining what these

mechanisms are and how they explain empirically observed phenomena. "How?" questions are concerned with "identifying practical interventions and outcomes with the objective of bringing about change" (Blaikie 2000:61) and are beyond the scope of this research, although potentially beneficial interventions likely become clear by the end of the thesis. Specifically, this research addresses the following questions:

1. What is the nature of the organisational response to resurgent TB in London?
2. What is the contribution of complexity theory features (and/or professional dominance and/or New Public Management features) in analysing the organisational response to this phenomenon?
3. Why does the organisational response to resurgent TB in London illustrate these features?, i.e., what are the mechanisms and structures which explain this organisational response?
4. Does complexity theory provide a theoretical basis for understanding the role of the New Public Management paradigm and practices within this case?
5. What perspective might Kingdon's (1995) theory of public policy development offer on TB control in London?

Research Strategy, Methodology and Methods

Nature of the Research

This research is qualitative in its approach, taking the form of a single, but large, longitudinal, multi-organisation case study; namely, the system responsible for controlling and treating tuberculosis in metropolitan London. As discussed at length in the previous chapter, the boundaries of the study necessarily extend beyond the NHS to include other TB stakeholders, all broadly diverse in size, function and form. These include small to large-sized organisations such as the Department of Health, the NHS, NHS London, particularly its public health and commissioning support functions, the Health Protection Agency, including some Health Protection Units, and the Find and Treat team. The research also extends to the voluntary sector; namely, TB Alert (an awareness raising and advocacy organisation). Physically, the research encompasses the five geographic healthcare sectors of London: South East; South West; North East; North West; and North Central, and includes all 31 Primary Care Trusts (PCTs), or

boroughs. While broad, these boundaries are consistent with a systems view of organisations, the approach adopted for this research.

As a logic of enquiry, or as its overarching research strategy, this research uses retroduction, "the interplay of induction and deduction...central to the process of scientific discovery" (Ragin & Amoroso 2011:76). Why retroduction is the best choice of research strategy for this work is discussed below, with a focus on the specific model of the retroductive process used in this study. A combination of narrative form and Miles & Huberman's (1994) method of data reduction, display and conclusion drawing were used to "feed" Ragin & Amoroso's (2011) model of retroductive inquiry. The narrative form is used to present and discuss empirical findings, which in this research mostly take the form of a series of smaller case studies. The resulting narrative reveals the relationships which characterise London's TB control system, along with key aspects of the system's history, retaining "the holistic and meaningful characteristics of real-life events" (Yin 2003:2) associated with case study research . However, the scope and volume of data collected required that it be manipulated to become more usable and manageable for conclusion drawing and theory generation, which is where Miles & Huberman's guidance proved useful. Software (HyperResearch) assisted with coding, textual analysis, data organisation and surfacing themes. Details regarding the case study method and the data analyses used are discussed later in this chapter and in Appendices B and C.

Research Strategy

The research strategy most closely associated with critical realism is retroduction (Blaikie 2000:108-114; Blaikie 2007:82-84; Danermark et al 2002:73; Pawson and Tilley 1997, Reed 2009). Whilst it is not a new logic of enquiry, retroduction has a limited history of use within the social sciences, likely because its traditional focus on model building makes its application outside the natural sciences challenging (Blaikie 2007:84,85) and perhaps incompatible with the nature of much social science research. However, Bhaskar (1979:20), Blaikie (2000, 2007) and Reed (2009), all specifically cite its utility within the social sciences. Critical realists are not purists. Blaikie observes that combining research strategies is a means of avoiding "unnecessary restrictions on the conduct of social research" (Blaikie 2000:262), a point also taken up by critical realist Sayer (2000). Critical realism scholars note that the program "does not...exclude any method *a priori*, but the choice of method should be governed...by what we want to know and...by what we can learn with the help of different methods...We have labelled

this working procedure 'critical methodological pluralism'"(Danermark et al 2002: 204).

Although retroduction has been characterized as "deduction+", there are two vital distinctions. First, deduction is concerned with prediction and building predictive models whereas retroduction has no such pre-occupation. Second, deduction is concerned with identifying patterns, whereas retroduction's job is to surface the generative mechanisms and structures which give rise to these patterns in the first instance. Blaikie (2007:83), citing Bhaskar, characterises retroduction as peeling back the layers of an onion in an effort to expose relationships and different levels of reality. A retroductive research strategy's objective is explanation, not prediction. And explanation is only possible when a regularity (i.e., an outcome) is described in terms of the relevant causal mechanism(s) in combination with the context in which it occurs (Pawson and Tilley 1997:67-72), or when the question "what qualities must exist for something to be possible?" is answered (Danermark et al 2002:81). Put another way, while employing the traditional hypothetico-deductive method answers the question "what follows from these premises?", retroduction asks "from what premises can this anomaly be shown to follow?" (Hanson 1971:66).

There is limited literature on the practical application and operationalisation of retroduction in the social sciences. Blaikie (2000:108-114, 2007:82-84) and Danermark et al (2002:108-111), two leading proponents of the use of retroduction in the social sciences, are simultaneously prescriptive and abstract in their explanations, and short on empirical examples. Blaikie suggests researchers build models with the objective of revealing the unobservable generative mechanisms causing the pattern of interest, testing this model in the form of hypothetical descriptions and then identifying the constraining and enabling factors as well as the context and contingencies at play (Blaikie 2000:109-112). However, he concedes that the emphasis on model-building arises from retroduction's more frequent application in the natural, as opposed to the social sciences, and does present challenges for social scientists (Blaikie 2007:82-84). Danermark et al (2002:108-111) prescribe a six-step method of retroductive analysis in which researchers move from the concrete to the abstract and back to the concrete, but they also stop short of offering any worked examples. Similarly, Tsoukas (1989) argues that while the data themselves can yield empirical regularities, abstract conceptualization is required to imagine the "generative mechanisms" that are driving them.

Ragin (1994:55-77) and Ragin & Amoroso (2011:57-78) adopt a slightly looser approach, as portrayed in Figure 16, and it is this model which largely guided this research. It is compatible with the narrative form (used in this study to produce the "images" noted below) and supports the use of the multiple theoretical frameworks applied in this research (complexity theory, professional dominance and NPM), each of which provided different inputs to the model's "ideas/social theory" component. The model also facilitates a highly iterative approach to data analyses and theory generation. Gramling et al (1998:1084) remark that "not all theory building strategies are clearly classifiable as either inductive or deductive", and retroduction, and the Ragin & Amoroso model, assisted this research in building theory inductively deductively, and retroductively as seen in Chapter Eight.

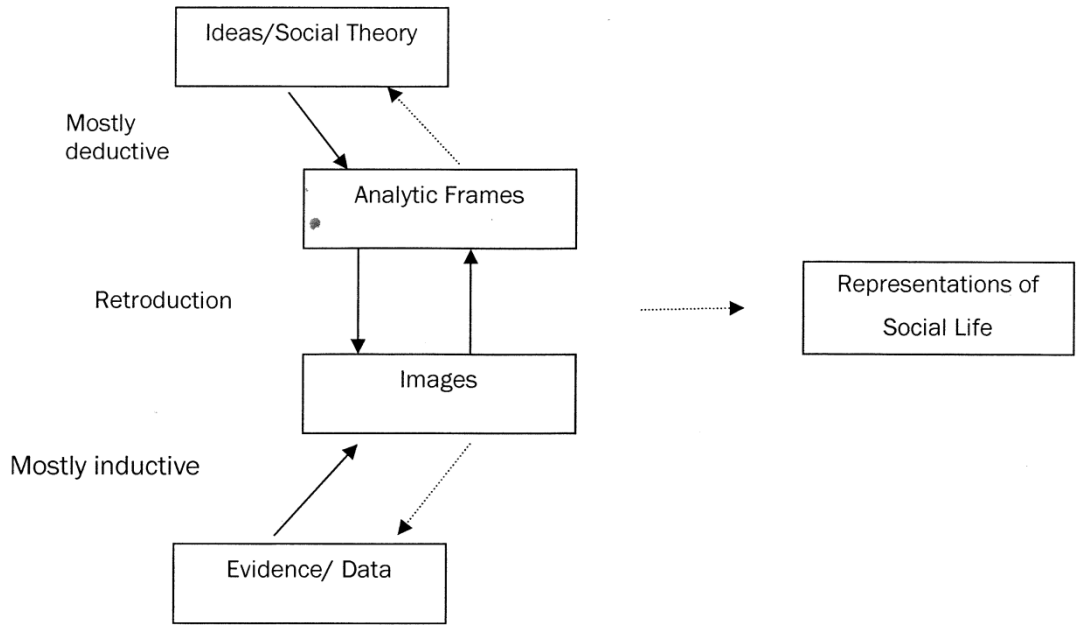


FIGURE 16: A SIMPLE MODEL OF SOCIAL RESEARCH (RAGIN 1994, P 57, RAGIN & AMOROSO 2011, P. 60)

In describing their model, Ragin & Amoroso (2011:75) observe

> *...(r)esearchers link pieces of evidence together to make images. The analytic frame provides the context for creating and understanding the image, establishing conceptual boundaries around the evidence-based image...representations appear to audiences as finished products, complete with images and frames.*

The authors also provide short, worked examples of their retroduction-based research strategy, and stress its particular value for case study research. Saether (1998) argues for its application within environmental science and the "greening" movement, sketching out how it might potentially be done, while Gramling et al (1998) use retroduction in a manner highly similar to that espoused by Ragin & Amoroso in their study of coping skills in young women. Gramling et al (p.1084) also specifically cite the utility of retroduction in building, expanding and/or clarifying theory, particularly when the phenomena under study "are complex and multi-faceted; truth is subjectively constructed and direct linkages of theory and research to context are crucial"; an apt description of this research. The Ragin & Amoroso model is consistent with Orton's (1997) observation that the closing of the gap between data and theory can begin at either or both ends (data or theory) and may often iterate between them, as is the case with this study.

Ragin & Amoroso (2011:130) observe that "(r)esearchers work back and forth between their ideas and their evidence, trying to achieve...a 'double fitting' of explanations and observations (that is, ideas and evidence). This process of double fitting is best understood as retroduction...". While they do not use the language of "mechanisms and structures", Ragin and Amoroso's suggested approach, as captured in Figure 16, clearly facilitates Bashkar's "peeling of the onion" – the elucidation of the generative mechanisms and structures at play within the phenomenon of research interest. Easton (2010:124) remarks that retroduction results in "the identification of mechanisms that explain what caused particular events to occur", presumably the "representations of social life" referred to in Figure 16, above.

Having described the use of the research strategy adopted in this study, the discussion now moves on to describe the research method used – the case study.

The Case Study Method

This research takes the form of a large, single case study comprising the multi-component system responsible for TB control in London, which then further generated a number of sub-case studies to enable cross-case comparison. Within the case study, three different theories have been applied to ground data collection and analyses so that the initial preferred theory, complexity theory, is not imposed on the data *a priori.* Yin (2003:4,40) espouses such an approach for testing or expanding existing theory. Comparing and contrasting different conceptual models within a major case study is a well known analytical technique: for example, Allison's (1971) study on decision

making in the Cuban missile crisis; Addicott et al's (2007) exploration of three models of power within healthcare networks and Talbot's (2010) use of a complexity theory lens *(inter alia*) to explore performance improvement in public services.

Henn et al (2006:65-66) refer to the case study as a type of *research design*, while Blaikie (2000:10,213-226) frames it is a *means of selecting data* with a consequently vital impact on how findings and results can be generalised. Yin (2003:1-3), in turn, proposes that the case study is a *research strategy*. Regardless of the terminology, the reasons for choosing a case based approach vary, but case studies are well-suited for analysing the dynamics of organisational processes and for explaining how and why things happen as they do (Stake 1994, Pettigrew 1990).

The Value of Case Study Research

As discussed above, case based research is consistent with critical realism (Easton 2010). The method has been noted as particularly useful for complexity theory research (Byrne 2005, Houchin & MacLean 2005, Klijn & Snellen 2009, Rhodes et al 2011), and particularly so when the complexity theory research is also informed by critical realism (Byrne 2009, Reed & Harvey 1992). In other words, this study. Further, the case study method has been identified as specifically useful for studying healthcare systems through a complexity theory lens because this approach supports analyses of the system from a holistic and dynamic perspective, holding promise for elucidating new insights (Anderson et al 2005).

The objective of case study research is to establish a causal argument about some social phenomena, its nature and how certain outcomes arise (Walton 1992:122). Case studies are useful for "observing the effects of otherwise unobservable, idiosyncratic effects" (Godfrey and Hill 1995:531), a consideration in this research. They are also effective for looking at the multiple levers and layers at play within organisations, for surfacing relationships through iterative analyses and for answering "why" questions (Eisenhardt 1989), again, all goals of this research. Also of significance for this research, case study research supports efforts to understand the relationship between the micro and macro levels under study:

> *…our ability to offer a full, causal explanation of any phenomenon rests upon exploring the micro/macro connection: "What structural factors govern or influence patterns of individual choice, how are those choices constructed, and what are the structural consequences?* (Vaughan 1992:182)

Blaikie (2000), Yin (2003) and Meredith (1998) offer spirited defences of the value of case study research and argue that it should in no way be seen as inferior to its more traditional and positivistic cousin, the "scientific" or experimental method. They argue that the combination of sound data collection, observation, triangulation and logic which characterizes case studies is every bit as valid as the mathematics and statistics used by rationalist researchers, and that case studies have the added benefit of capturing contextual and temporal richness, particularly important features in complexity theory research. Ragin (1992:4-5) remarks that "variable-oriented comparative work...as compared with case-oriented comparative work, disembodies and obscures cases." Byrne (2009:4) argues that the increased interest in case study research arises from dissatisfaction with the use of variable-based modelling when trying to understand causality, again a relevant point for complexity theory research such as this.

In terms of theory development, the case study method has been shown to be a valid tool, particularly in a younger field of research (Eisenhardt 1989, Ngwenyama & Nørbjerg 2010). Theory building is generally an incremental process, in the Kuhnian sense, building on previous empirical research efforts. However, in the absence of a significant body of empirical work, as with organisationally focused complexity theory research, "theory building from case research is particularly appropriate" (Eisenhardt 1989:548). This is so for two reasons: (a) theory building from case studies does not require either prior literature or empirical data; and, (b) the process of theory generation used with case studies is highly iterative, often surfacing conflict and paradox within findings (Eisenhardt 1989). This approach is likely to result in "the kind of novel theory which is desirable when extant theory seems inadequate" (p.548). Ragin (1992:224-225) observes that case study research makes an important contribution to the primary goal of all research, "to link the empirical and the theoretical – to use theory to make sense of evidence and to use evidence to sharpen and refine theory...produc(ing) theoretically structured descriptions of the empirical world that are both meaningful and useful."

Reliability, Validity and Generalisability of Case Studies

Diefenbach (2009[b]:883), quoting Hammnersley, observes that an "account is valid or true if it represents accurately those features of the phenomena that it is intended to describe, explain or theorise". Relative to quantitative research, qualitative research is generally viewed as having more validity, particularly internal validity, because of the

thick, rich descriptions it often generates, while quantitative research is usually thought of as being more reliable (i.e. replicable), because of its reliance on experimental and survey methods. Although Yin (2003) argues that not all case study research need be qualitative, one of the widely accepted strengths of qualitative case study research is its capacity to allow "investigators to retain the holistic and meaningful characteristics of real life events" (2003:2), the means by which internal validity is enhanced.

Whilst case studies are sometimes criticised for lacking external validity, or generalisability, Yin (2003:37) counters this argument by pointing to case studies' value in analytical generalisation by way of theory building. He cautions against comparing case studies with survey research which relies on statistical generalisation. Gillham (2000:12) and Yin (2003:31-33,37) observe that while there may be limits to generalising the particular *findings* of an individual case study, the *theory* which a case generates might indeed be generalised to other settings. This generalisation begins to "stake out ...causal processes...(and)...a different kind of universe is posited...The explanatory principles revealed in case studies are generalized because they can solve new problems, explore new terrain..."(Walton 1992:126). Byrne (2009:2) calls on critics of social science research to remember that the discipline does not aspire to establishing universal laws, and that a distinction must be maintained between generalising and universalising. He further argues that case based research in particular should be recognised as a useful means of "moving beyond a useless and destructive tradition in the social sciences that have set quantitative and qualitative modes...against each other" (Byrne 2009:9).

Appropriateness of Method to this Research

London's TB control system is an appropriate and relevant site to inform a case based complexity theory study seeking to produce description and explanation (i.e., identify the mechanisms responsible for the empirically observed processes) because:

- it has clearly defined geographical boundaries;
- its objective, whilst unarticulated, is clear (to manage and control TB in London);
- it is comprised of numerous (circa 70), largely independent, components, or subsystems; and,
- it addresses a complex (public health) phenomenon.

This study is qualitative in nature and used archival documents, semi-structured interviews and "detached" or non-participant observation to gather data. As discussed,

it is grounded within a critical realist research paradigm. As previously established, on its own, a positivist, quantitative approach to data collection and analysis would be neither sufficient nor appropriate to meet the aims of this research as the systemic relationships and interactions amongst subsystem components within the TB control system would be lost; "the entire social system and all of its elements" would not be seen "as a coherent whole" (Klijn & Snellen 2009:45). Further, positivists have difficulty accepting the existence of unobservables (Wicks & Freeman 1998), which are an important aspect of this research. Similarly, a purely interpretivist method also falls short because of that paradigm's views that (a)organisations do not really exist (Burrell & Morgan 1979), and (b)that causality is essentially indiscernible (Easton 2010). Consequently, a critical realism paradigm is most appropriate for this research as, in addition to being compatible with case study research, it (a) supports the search for causality via the identification of unobservables and generative mechanisms, and (b) assumes the existence of an independent reality "out there", although our knowledge of this reality is incomplete, imperfect and shaped by theory (Easton 2010). These are both important aspects in meeting this study's objective of answering "what" and "why" questions.

Gathering Evidence in Case Study Research

Before any research strategy can be applied, or data analysed, evidence and observations must be collected. Yin (2003:83) identifies three important considerations regarding case study data collection: using multiple sources of evidence, building a "database" of evidence and establishing a "chain of evidence" to make clear the links between questions, data and conclusions. Gillham (2000:18) remarks that the most important aspect of collecting data in case study research is striving at all times to keep an open mind.

As noted earlier, since case study research can be either quantitative or qualitative, it accommodates the use of a variety of methods in gathering evidence. Gillham (2000:21) cites the following as appropriate:

- documents
- records
- interviews
- "detached" observation
- participant observation
- physical artefacts

Readers are referred to Appendix B for detail regarding the specific data collection methods employed in this research, along with detail on the data itself.

Data Analyses

In order to "feed" Ragin & Amoroso's (2011) retroductive research model (Figure 16), data resulting from the evidence and observations collected must be manipulated, or analysed, to produce the required "images" and, eventually, the "representations of social life", or findings, of the research. The narrative method is used to present the empirical findings of this research (Chapters Six and Seven) and to assist with theory generation, as will be discussed shortly. Ultimately, it is used to capture the "representations of social life" to which Ragin & Amoroso (2011) refer, i.e., the findings and conclusions of this research. Miles & Huberman's (1994) framework, as illustrated below in Figure 17, was used to generate the "images" required by Ragin & Amoroso's model and to assist with validating the "representations of social life", or findings, of this research. Miles & Huberman's (1994) framework parallels Ragin & Amoroso's model, particularly with regard to its iterative and recursive approach to reaching conclusions and in its ability to support inductive, deductive and retroductive research strategies. Combining the two models proved a useful method: the Miles & Huberman (1994) model provided valuable guidance in producing usable "images", and the Ragin & Amorso model provided a means of theorising these images.

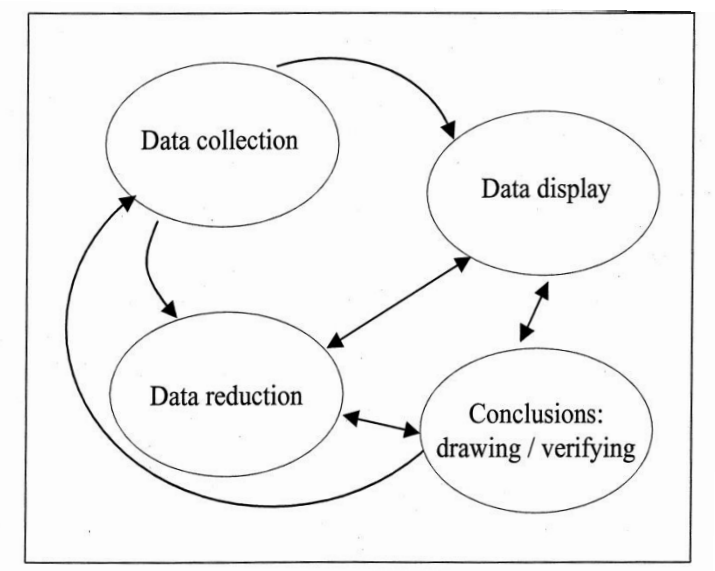


FIGURE 17: COMPONENTS OF QUALITATIVE DATA ANALYSIS: AN INTERACTIVE MODEL (MILES & HUBERMAN 1994:12)

A discussion of the key steps in Miles & Huberman's (1994) framework, and details regarding its application in this research, are found in Appendix C.

The Narrative Form

As mentioned above, I have also employed the narrative form as a means of data presentation and theory generation in this research. Theory is, or can be, narrative in that it provides an explanation connecting cause and effect (Dimaggio 1995, Pentland 1999). DiMaggio (1995:391) defines theory as "an account of a social process, with emphasis on empirical tests of the plausibility of the narrative".

Whether narrative and causal explanations are contradictory or alternative to each other, Elliott (2005:97) observes that even statistical associations are increasingly questioned with respect to their ability to show causality in the absence of underpinning explanatory theory. The apparent contradiction between narrative's focus on capturing "time and place" and causal theory's efforts to be timeless and capture an "essential reality" is increasingly contested. Elliott remarks that narrative form need not always equate with interpretivism, citing the concept of "narrative positivism" which "emphasizes temporality, context and contingency" (Elliott 2005:98-99). Another example is the use of case studies in medicine.

The ability of narrative thinking to capture context is important (Tsoukas & Hatch (2001). Critical realist research acknowledges the importance of context and contingency in determining the enabling and constraining factors which may impact events, including how, or whether, mechanisms are activated (Sayer 2000:15; Pawson & Tilley 1997:58,69, Byrne 1998:113; Fleetwood 2005). It largely accepts the interpretivist assertion that "causal forces...merely print little replicas on our retinas. From there on it is up to us to make something out of these replicas by telling a story" (Rorty 1985). Narrative is specifically recommended when working with a single case characterised by ambiguous situations and "variety and richness" (Langley (1999:695), as embodied by this research. And Ragin & Amoroso cite the use of narrative and, specifically "vignettes describing typical or exemplary cases" (2011:75), of which a variation is used in this research, in the form of the shorter, (sometimes) comparative case studies developed in Chapters Six and Seven.

However, it is Tsoukas & Hatch's (2001) convincing arguments regarding the value, perhaps even the necessity, of using the narrative form in organisation based complexity theory research, which is of most relevance for this study. As discussed at

some length in Chapter Three, one of complexity theory's chief tenets is that prediction beyond the short-term is not possible, calling into question the utility of proposition testing within complexity based research. Specifically, Tsoukas & Hatch (2001) raise three significant limitations on the use of propositional-mode thinking in complexity theory research:

1. *Imperfect generalisations*

   Propositions are generalisations, or rules. However, in real organisational life, people usually face circumstances which are unique and require unique, localised responses. Historical knowledge is of some, but limited, value in responding to current problems, but practitioners do need to understand how the current state of their organisation arose. This historical knowledge "cannot be provided by propositionally organized renderings of human experience...it requires a contextually sensitive narrative" (p.994).

2. *Tacit justification*

   Implicit justifications are the reasons for having rules (i.e., *if* you do x, *then* y will follow). Paradoxically, sometimes it is necessary to break a rule in order to meet the justification. However, propositions cannot accommodate paradox because within propositions "the conclusion should deductively flow from the premises" (p.994). Also, implicitness means that justifications cannot be propositionally stated because "it would inevitably be based upon a further implicit justification and this...would be reproduced ad infinitum" (p.994) And whilst rules certainly exist for specific purposes, these purposes cannot be stated within the proposition; rather, narrative is required to explain why specified rules should be followed.

3. *Consistency and non-contradiction*

   There is often a conflation of logic requiring both timeless rules and temporal causality within if-then statements. Some propositional statements have no temporal or causal elements ("If Euclid's axioms are accepted, then the sum of all angles in a triangle is 180 degrees) while others ("If the temperature falls below 0^0 C, then the water begins to freeze") have both. Owing to narrative's "sensitivity to the temporal dimension of experience" it can reveal, and avoid, such conflations (p.995).

To sum up, propositionally focused research is compelled to ignore the particular (1, above), the local (2, above), and the timely (3, above), which, combined, represent a

significant shortcoming for an organisational research study. Furthermore, propositions require that paradoxes be avoided, an incompatible scenario with the reality of complex systems. The narrative mode, on the other hand, supports the analyses of such organisational features (Tsoukas & Hatch 2001) which is why it is used in this study.

The Use of Mini, Comparative Case Studies in this Research

Narrative and, specifically "vignettes describing typical or exemplary cases" (Ragin & Amoroso 2011:75) are used this research. Such mini case studies are an effective means of data presentation because of their potential to reveal the systemic relations apparent within actual behaviours between and amongst the various components and actors within London's TB control system. They reveal the system in action. The particular mini case studies used in this thesis capture especially revealing or trenchant episodes in the history of TB control in London, and often provide useful comparisons and/or relevant contrasts. Comparative case-based approaches fit well with complexity theory research, and case studies employing comparison are the "foundations of useful theoretical descriptions of the social world" (Byrne 2009:3). Comparisons are useful (a) to identify links between outcomes and case characteristics, i.e., causality patterns, including for the study of healthcare systems (Anderson et al 2005), and (b) to identify what is similar and dissimilar, assisting researchers in "the exploration of multiple and complex causality" (Byrne 2009:5). Two of the four case studies presented in this study are comparative in nature.

Purposeful Sampling and Mini-Case Selection

This research uses mini-cases selected using principles of non-probabilistic purposeful sampling to support relevant empirical analysis (Eisenhardt 1989, Miles & Huberman 1994, Coyne 1997). A fundamental principle of purposive sampling is to locate and select empirical situations within which the phenomena of interest can be observed, instead of randomly selecting empirical situations for interrogation (Curtis, et al. 2000). Blaikie (2000:197) observes that all social research requires its practitioners to exercise judgment regarding how they select cases for their studies. In the broadest sense, case selection takes the form of either probabilistic (i.e., random) or non-probabilistic sampling. But beyond that, Blaikie argues, case sampling "is frequently the weakest and least understood part of research designs" (p.197). Coyne (1997) contends that if the processes surrounding case selection were made more transparent,

many of the concerns regarding the utility and value of qualitative research would be addressed.

One type of non-probabilistic sampling is "purposeful" sampling, often referred to as "theoretical sampling" (Eisenhardt 1989), although some argue for the terms to be used distinctively (Coyne 1997). The case studies developed here reflect the concept of "purposeful sampling", defined by Patton (1999) as sampling which

> *...involves studying information-rich cases in depth and detail. The focus is on understanding and illuminating important cases rather than on generalizing from a sample to a population... Rigor in case selection involves explicitly and thoughtfully picking cases that are congruent with the study purpose and that will yield data on major study questions" (Patton 1999:1197).*

According to Blaikie (2000:205), "theoretical considerations" often inform case selection. Similarly, Miles & Huberman (1994:34) advise that sampling efforts should be relevant to the "conceptual frame and research questions" and also enhance the theoretical generalizability of the research. For example, research studying the behaviour of mental health inpatients would be undertaken in mental health institutions and not in a diabetes outpatient clinic. Sometimes researchers will purposely choose cases which illustrate contrasting outcomes (as seen in mini case studies one and four in this research), or those which strongly embody certain theoretical elements under study, (as in case studies two and three here) (Blaikie 2000:205). The cases were selected and developed in order to illustrate behaviours and phenomena of interest, consistent with the three initial frameworks chosen for the research. The frameworks guided the strategic choice of cases, dictating the cases' foci and boundaries. Extensive discussions in supervision also informed case development.

The shorter case studies presented in this research emerged from analysing a combination of data derived from interviews and field observations along with information culled from archival documents, particularly for the analytic history of TB control in London, comparing New York City's response to their TB epidemic with that of London, and the (mini)case study which analyses a 13-year drug-resistant TB outbreak in London. . Taken in their totality, the mini-cases also offer important details on the context in which London's TB control system functions. A brief explanation of why each of the cases was selected follows.

Case Study One: An International Comparison Between Tuberculosis Control in New York City and London

This comparative case was chosen as it illustrates a potential pattern of causality, or a link between the outcomes of TB control efforts in New York City and those in London, and the characteristics of each case. It provides a particularly stark contrast between the organisational structures of the TB control systems in the two cities. London's system is highly fragmented and largely leaderless, whilst New York City's system is verticalised, hierarchical and with clearly defined leadership (and accountability). It illustrates the impact of NPM organising principles on London's TB control system; especially the fragmenting nature of the quasi-market and the power of managerialism (as seen in the quashing of the control board concept).

Case Study Two: An Ongoing Outbreak of Drug Resistant TB in London

Several complexity theory concepts are illustrated in this case, along with highlighting the dynamic between HM prison service, the healthcare system, the Department of Health and the HPA. It offers a clear illustration of the lack of co-adaptation which has come to characterise London's TB control system, of the role of historicity in impacting how prisoner TB care is currently delivered, and of the non-linearity in response by the system to the drug resistant outbreak. It also demonstrates NPM-induced fragmentation within the prison healthcare sub-system, arising from the introduction of the internal market.

Case Study Three: Creating the Health Protection Agency

This case exemplifies a number of NPM-related precepts, mainly relating to the role of the quasi-market. Specifically, the creation of the HPA embodies disaggregation, agencification and hollowing-out within the healthcare system, and has lead to the loss of policy making capacity within the Department of Health. As with Case Study Two, this case also illustrates key aspects of the relationship between the Department of Health and the HPA, especially the lack of clarity regarding roles and responsibilities within London's TB control system. Complexity theory concepts are surfaced, too, in this mini-case. For example, the HPA's genesis can be seen as another segment in the long and ongoing saga of NHS hyper-reorganisations, i.e., demonstrating the role of historicity.

Case Study Four: Two Self-Organising Initiatives, Two Very Different Organisational Outcomes

Whilst mainly chosen to illustrate the complexity theory concept of self-organisation by contrasting the outcomes of two different nurse-led initiatives, the diametrically

opposed outcomes of the projects are discussed as resulting from the impact of an NPM induced need to control and manage risk. This case also offers evidence of the other four aspects of complexity theory discussed in this thesis (non-linearity, the role of historicity, the role of system diversity and system level co-adaptation). As with the other cases, the dynamics between actors, mainly the NHS London and the Find & Treat Team, are also highlighted.

The concept of "purposive sampling" implies that some empirical findings may not be included in each and every presentation of a research study, as is the situation here. The research undertaken for this thesis found some additional evidence of self-organisation, the lack of system co-adaptation and non-linearity which is not presented in this thesis. These findings were, however, highlighted in Trenholm & Ferlie (2012) in two brief vignettes. First, a TB clinic in a socio-economically deprived borough in London provided a clear example of self-organisation which resulted in (minor) innovations within the TB control system. However, none of the clinic's initiatives were replicated by other clinics, despite the initiatives being well known within the system. This points to a wider lack of learning, or co-adaptation across the system. Second, minor evidence of some non-linearity was found in the ongoing, significant investment by government in x-ray machines at airports, the purpose of which is to detect TB in visitors or migrants to the UK. Despite solid evidence that performing random chest x-rays is an ineffective tool for finding TB, investment in the program continued for years and is only starting to wind-down now.

A decision was taken, again after discussion in supervision, not to include these two vignettes in this thesis for two reasons: (a) whilst interesting, their inclusion would simply have confirmed, rather than changed, the outcomes reported in this research (so they broadly confirmed the results of the more extensive vignettes that are presented here and did not change the conclusions of the thesis) and thesis word count limits were a concern, and (b) the data which gave rise to the vignettes was limited and not capable of supporting more sustained analyses than that presented in Trenholm & Ferlie (2012). It is also important to note that no significant empirical findings arising from this research have been omitted from this thesis. No other potential case studies were identified in fieldwork.

Despite the contention that all sampling is purposive (Coyne 1997), during data analyses and case development I was consistently trying to identify phenomena or findings which were unexpected or inconsistent with what the three chosen theoretical

frameworks could be expected to "predict". This approach is consistent with the concept that "all science is by negation", making it vital that researchers consistently try to refute their conjectures and expectations. With specific regard to sampling, Patton (1990:178) refers to this approach as "confirming and disconfirming", noting "it requires significant rigor and integrity" by the researcher. Maintaining such "rigour and integrity" was a consistent and constant concern during this research.

In this research, two key conjectures, or expectations based on the applied theoretical frameworks, were refuted. First, and most importantly, medical consultants were not found to be a dominant force at the system level, contrary to the theory of professional dominance. Whilst they were the undisputed dominant forces within their TB clinics, this dominance was not maintained by the consultants at the system level, the potential reasons for which are discussed in Chapter Seven. Second, the research found very limited use of formal contracting within the commissioning function for TB services, contrary to established NPM norms. Both of these issues will be revisited in later chapters.

Limitations, Challenges and Other Issues

This research was self-funded and, as such, was not conducted under the auspices of an official "sponsor" such as the NHS or NIHR. I anticipated this could make access more challenging, and it may have. On balance, however, most components of the TB system were co-operative, and indeed, supportive of this study.

The London TB Commissioning Board sent a widely distributed e-mail to TB stakeholders, some of whom were no longer working within the Network, outlining my research, indicating their (non-financial) support and asking stakeholders to respond positively to my request for an interview. Whilst this proved most helpful, I was cautious at the time about becoming too closely associated with the TB Commissioning Board, as some people involved with TB control in London were, and remain, sceptical about its role. On reflection, this was not a valid concern as the people I interviewed assumed, correctly, that research of this nature could only be undertaken with the support of the TB Commissioning Board and they did not appear to perceive me as being unduly influenced by the Board.

My main source of archival documentation was a combination of the TB Commissioning Board and other current and former TB professionals, some of whom had amassed significant personal TB archives which they were willing to share.

The HPA was less forthcoming in terms of document sharing, but was very agreeable to meeting observation and employee participation in interviews. The DH was less cooperative in terms of consenting to my attendance at its meetings, sharing documentation, or allowing current employees to be interviewed, aside from one individual. The reasons underpinning the DH's caution were never clear.

Accessing documents from between 1988-2001 was challenging. This was largely due to a relative lack of activity during this time resulting in limited documentation being produced, especially until the mid-late 1990s. More generally, I had more limited success in accessing correspondence, e-mail, and other non-public documentation than I had hoped for. I attribute this to a combination of factors: many documents were destroyed or lost; informants often lack the time and resources required to gather and screen such information; and, nervousness about potentially revealing too much was another likely factor.

I also interviewed two TB experts in Canada: the first was responsible for Health Canada's (the DH equivalent) TB strategy; and the other was a public health leader of both the province of Quebec and the City of Montreal. My initial intention was to undertake a mini case study comparing London with Montreal, and comparing Canadian/Montreal TB policies with those in the UK/London, but I concluded that TB infection and control within these jurisdictions is too different to be fairly or usefully compared, despite both having high levels of foreign migration. (Montreal's target TB rate is 3.5/100,000, which they seem generally to achieve, while London is struggling to contain its infection rate in the mid-40's/100,000, as discussed in Chapter Two.)

Finally, TB control in London is in the midst of what some participants describe as its most significant period of change ever. (Although many also feel, in terms of service delivery at least, nothing much ever changes other than job titles, and other superficial restructuring.) Regardless, when my data collection period began in late 2009, the TB control system was being re-organised with a view to facilitating a centralised, pan-London approach to commissioning TB services, in recognition of the need to reduce duplication and increase standardisation. However, this effort quickly ran up against the very substantial organisational changes heaped upon the NHS by the coalition government elected in May 2010. These changes had a clear impact on the efforts of the TB Commissioning Board to reconfigure TB services. At the time of writing the future direction and shape of TB control in London remains unclear. During my upgrade presentation (from MPhil to PhD candidate status) in July 2010 I flagged this as a

potential issue and believe it is useful to identify it again. NHS restructuring efforts have resulted in staff turnover, busier-than-average work days, and a notable increase in overall anxiety levels, all of which may, in turn, have impacted my data collection efforts.

Reflexivity

Blaikie (2000:54-56) highlights the now widely accepted view that social science researchers must be reflexive in their approach to research, particularly when conducting qualitative research. Citing various scholars, he argues that neutral detachment from their research subject(s) is not possible for researchers; consequently, it is important that a researcher's biases, values and assumptions be confronted and acknowledged. Writing with specific regard to case study research, Diefenbach (2009[b:]885) also notes the importance of researcher reflexivity, particularly in regard to selecting and analysing data, stressing "there is no chance to achieve any kind of positivistic (pseudo-)objectivity in the process...It is a creative process and its quality...is a result of the skills and courage of the researcher."

As a researcher, I had no prior knowledge or involvement with TB, the system responsible for controlling it in London or the English healthcare system. As I am not a UK native I had not formed any views on the effectiveness or efficiency of the NHS, although I do concede a bias in favour of publicly funded healthcare. Prior to pursuing a PhD I worked for almost two decades within the Liberal Party of Canada as a political and strategy advisor. The Liberal Party is best described as centrist, but with deep social democrat roots and a long history of pursuing and enacting equality-seeking policies. This is potentially material in that I share these Liberal values, a fact which I surely did not entirely succeed in suppressing whilst undertaking this research and subsequently writing this thesis. However, being acutely aware of these quite deeply held values means I have also tried to "manage" them as much as possible. My prior professional history also means I tend to see social issues from a public policy perspective, puzzling about how problems might be solved using the tools and tricks of the political trade. I've little doubt that it is why Kingdon's agenda-setting theory resonated so clearly when I finally found it.

Ethics Considerations

Ethical considerations must be of great concern for researchers. After submitting a research outline, protocol and interview schedule for review in January 2010, King's College Hospital Research Ethics Committee determined that separate NHS ethics approval was not required for my research. Following this determination, I received final ethics approval on 25 May 2010 from King's College London, after which time I was able to start conducting interviews. A copy of the letter of approval from King's College London and a copy of the approved research participant consent form, including the ethics approval code, are attached in Appendix D.

Primary among ethics concerns is that informed consent is given and confidentiality and participant anonymity are assured. All interview participants provided signed consent forms which ensured their information would be treated confidentially and explained their right to withdraw from the research at any time. In terms of guaranteeing the safety and anonymity of the data, I took such safeguarding precautions as using password protection for all text and audio files, and locking documents, transcripts and other sensitive files in a secure location.

Concluding Remarks

This chapter has discussed issues related to the choice of research philosophy, methodology and methods relevant to this study: a single but large-scale qualitative, complexity theory-informed case study set within the healthcare system. The chapter outlined the critical realism paradigm and discussed at some length why it is the best choice for this research, rather than positivism or interpretivism. Next, the research questions which guide this study were introduced. These questions are "what" and "why" questions, as indicated by a study with description and explanation as its major goals. The use of retroduction as a research strategy was discussed. Then the case study method was detailed, highlighting its appropriateness for this research and discussing the specific research methods used. The discussion then moved on to issues related to data analyses, with an overview of how data was collected, managed and analysed in this research. Before closing with a discussion on how ethical concerns were addressed and the role of researcher reflexivity, this study's use of narrative as a tool for data presentation and theory generation was highlighted.

The next chapter marks the start of the presentation and discussion of the empirical findings of this study.

CHAPTER SIX: EMPIRICAL FINDINGS: PART ONE

Introduction and Purpose of Chapter

This chapter provides the analytic history of London's TB control system at the macro and system levels. It provides:

1. an overview of the organisational and structural features of the system, comprised of multiple agencies and professions;
2. an account of the present system's recent history and how it has evolved to its current form:
3. a review of the many studies and reports into London's TB resurgence which accompanied this evolution, noting that most of the resulting advice and recommendations have been left unheeded; and,
4. a mini-case study comparing the London TB control system to New York City's.

Providing such a retrospective view relates to the complexity theory concept of recognising the importance of "historicity" or "path dependence", as outlined in Chapter Three. An analysis of a system's history illustrates important systemic relations and their impact, such as those between the NHS, the Department of Health, and the Health Protection Agency, or the TB Commissioning Board and NHS London. This also manifests as "circularity" (Tsoukas 1998) which presents as ongoing action leading to little change, a defining feature of the London TB control system.

Writing in the Introduction to the Special Issue on complexity theory in the journal *Organization*, (Tsoukas 1998:303) asks,

> *How else could one hope to do justice to the historicity of the phenomena to be explained, if not by narrating how the actions of interacting agents and the occurrence of chance events, unfolding in time, have been intertwined to generate the phenomena at hand?*

Drawing inspiration from this observation, this analytic history of London's TB control system helps "to do justice" to developing a complexity theory based understanding of the system. McKelvey (2003) observes that complexity science may best be described

as an effort to explain "order creation". Implicit in this argument is the need for an historical overview of how the system (not just a single organisation) in question arrived at its current state.

This chapter also argues that the overall public policy context in which the system has been operating - one still heavily influenced by New Public Management principles - has affected the manner in which the complexity theory based features of the system were observed. Finally, a short case study is developed, contrasting London and New York City's approaches to TB control. It highlights London's highly fragmented, unaccountable, medically-driven and leaderless system with the New York City Bureau of Tuberculosis Control which is a hierarchical, verticalised, diverse, organisation with a clear public health focus and strong leadership and accountabilities. The mini case study also discusses the longstanding ambivalence in London toward embracing learnings from other jurisdictions' successful TB control programs. Taken together, the analysis of the history of London's system and its contrast to that of New York City, lays a firm foundation for the remainder of the empirical discussion in Chapter Seven.

Analytic History of the Organisational and Managerial Response to TB Control Across London

Chapter Two discussed the extent and nature of resurgent TB in London today, illustrating the serious and ongoing nature of the problem. The next section examines the broader environmental organisational and structural context in which London's TB control efforts are undertaken, highlighting efforts to date in controlling the re-emergence of the disease.

Analysing tuberculosis control in London: no stone left unturned

Tuberculosis control in London has clearly proven challenging for major players within London's healthcare system. The NHS, the Department of Health, and the Health Protection Agency (and its precursors) have all wrestled, with varying degrees of engagement, with how to reverse rising TB rates. Nonetheless, lack of success in tackling TB in London cannot be attributed to lack of knowledge about the problem, or to lack of calls to action. A striking feature of the system is the volume of papers and reports produced since the mid-1990s analysing the TB situation, contributing to what one high-level respondent referred to as "...paralysis by report and recommendations". These reports vary in intended audience, authors and foci, but demonstrate that TB has

long been acknowledged as a problem in London and there have been consistent and ongoing calls for urgent action. Figure 18, below, highlights the 14 commissioned and internal studies and reports, discussing various aspects of the problem of resurgent TB in London and/or England and the UK.

Year	TB Group Formed	Commissioned/Internal Report or Study
1992	First 'working party' of London Consultants in Communicable Disease Control established – focus on surveillance	
1996	Interdepartmental Working Group on Tuberculosis formed, led by Department of Health	**Report 1** The Interdepartmental Working Group on Tuberculosis, (i) The Prevention and Control of Tuberculosis in the United Kingdom: Recommendations for the Prevention and Control of Tuberculosis at the Local Level and (ii) Tuberculosis and Homeless People (Dept. of Health and Welsh Office)
1998		**Report 2** Interdepartmental Working Group on Tuberculosis – Focus on HIV and Drug-Resistant TB (Dept. of Health) **Report 3** Tuberculosis control in London – The Need for Change (NHS Executive)
1999	"TB in London" group formed	**Report 4** Improving TB Control in London (NHS Executive)
2001		**Report 5** TB Control in London: Next Steps (London TB Group for London NHS Regional Office)
2002		**Report 6** Getting ahead of the curve: A strategy for combating infectious diseases (Department of Health)
2003		**Report 7** Tuberculosis in London (London Assembly Health Committee)
2004		**Report 8** Stopping Tuberculosis in England: An Action Plan from the Chief Medical Officer (Department of Health)
2005	"Stopping London in TB" group formed	
2007		**Report 9** Tuberculosis prevention and treatment: a toolkit (Department of Health)
2008	TB Commissioning Board and Clinical Working Group formed	**Report 10** An Audit Evaluation of Pan-London TB Services and Training Needs (Commissioned from London Southbank University)
2009		**Report 11** Tackling Tuberculosis in England: the PCT response to the challenge (Commissioned by The All-Party Parliamentary Group on Global TB, The British Thoracic Society, TB Alert and The Royal College of Nursing)
2010		**Report 12** London TB Service Review and Health Needs Assessment (known as The PHAST Report). (Commissioned from the Public Health Action Support Team)
2011		**Report 13** TB Model of Care (NHS- London Health Programs) **Report 14** TB Case for Change (NHS- London Health Programs)

FIGURE 18: TIMELINE OF KEY EVENTS, INCLUDING REPORTS PRODUCED, WITHIN THE LONDON TB CONTROL SYSTEM

Figure 19, below, illustrates the simultaneous rise in TB infection while these reports were accumulating

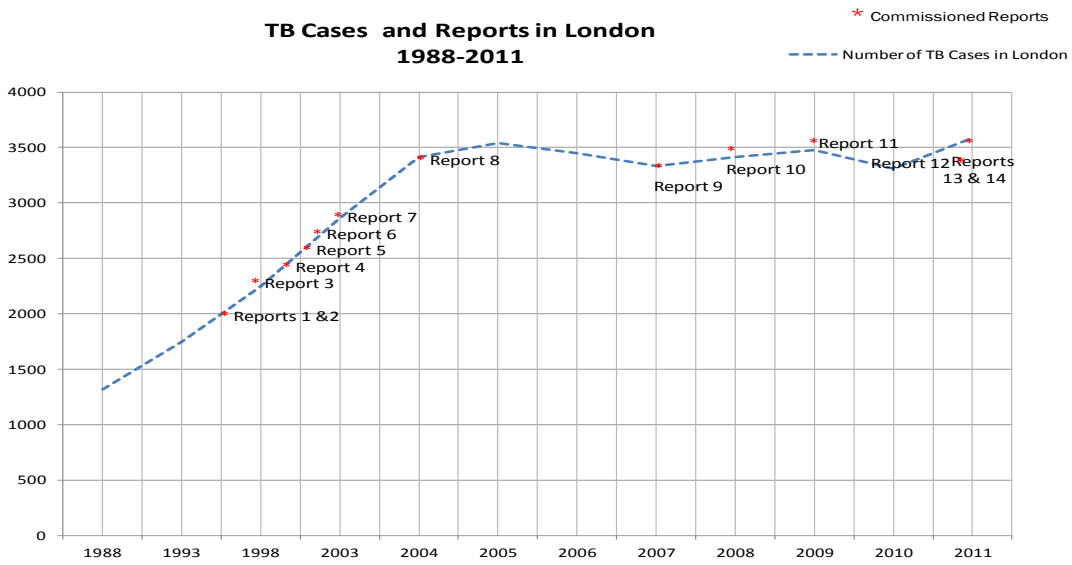


FIGURE 19: TB CASES GROW ALONG WITH THE NUMBER OF COMMISSIONED AND INTERNALLY PRODUCED REPORTS

To the above list of reports could be added the richly detailed Annual Reports on TB in the UK and reports on TB in London produced by the HPA, all of which include recommendations for swift action along with well developed epidemiological data showing the severity of the TB resurgence. In its 2010 report on TB in the UK, the Agency recommended:

> *The national effort to control tuberculosis needs to be scaled up in order to halt the continuing rise in cases and ongoing transmission....Specific urban control measures should be applied, using examples from cities in other western countries. Appropriate local mechanisms for governance and coordination of city-wide control activities should be instituted...(Health Protection Agency 2010[b]:5)*

There have been many academic papers, some cited in this research, discussing a wide range of clinical, epidemiological and social issues related to London's TB epidemic. And the National Institute for Health and Clinical Excellence, NICE, provides up to date clinical guidance, including special, recently released guidelines on treating TB in the "hard to reach" patient populations.

The Nature of the TB Control System

Whilst these reports were being produced, the TB control system in London was constantly morphing and reconfiguring, often in response to ongoing NHS and DH restructuring initiatives. The extent of change within the NHS has been a significant factor in London's inability to control TB. For instance, the Centre for Disease Surveillance and Control, the source of much of the membership of the Working Party of Consultants in Communicable Disease Control, the first group to study London's rising TB rates, disappeared in 2003 with the creation of the Health Protection Agency. Similarly, the Department of Health continued to downsize and reduce its role in TB control over the years. In fact, by 2010, their participation in formal TB control groups was very limited, with one respondent observing that the Department was effectively "out of the TB business". The impact of these particular changes, the creation of the HPA and the "hollowing out" of the Department of Health, will be discussed in greater detail in Chapters Seven and Eight. Nonetheless, there remains a small, core group of individuals, mostly consultants, but also a few nurses, who have been working within the system almost since the beginning of the TB resurgence and who remain dogged in their determination to turn the TB tide.

Respondents' accounts of the system's history all differed somewhat. Most people, particularly nurses and doctors, noted that because the treatment regime for TB patients has remained largely unchanged over the past few decades, the changes in the structure of the broader TB control system are tangential and obscured by larger scale change and turbulence within the NHS. However, based on accounts by respondents, combined with information gleaned from archival documents, a reasonably detailed and accurate historical overview has been developed, identifying the groups formed to guide TB control in London since the onset of the current epidemic. Figure 20, below, illustrates the ongoing organisational restructuring within London's TB control system, highlighting the various groups charged with leading TB control efforts over the past 23 years.

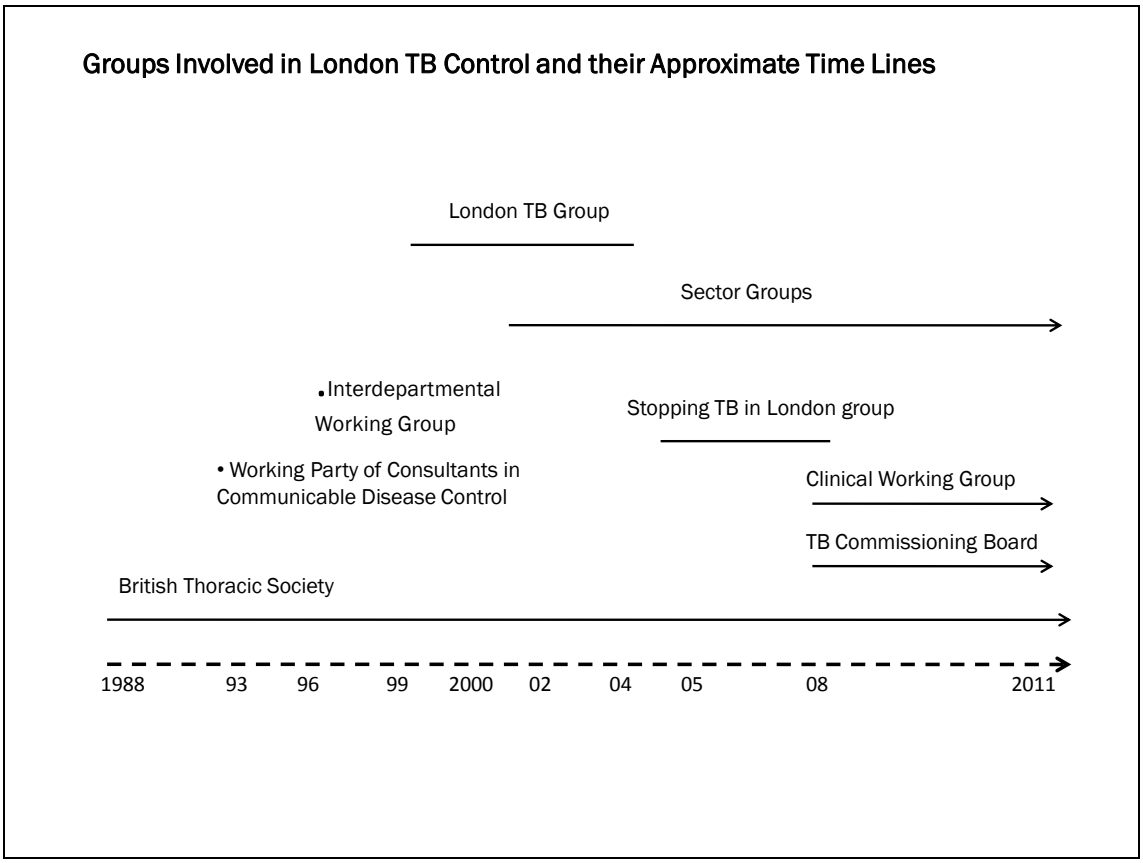


FIGURE 20: APPROXIMATE TIME LINES OF TB CONTROL GROUPS IN LONDON

Key Groups Involved in London's TB Control System

For a detailed overview of the groups involved during the early stages of TB's reappearance in London, along with their key activities, please see Appendix F.

Later Groups

By 1998, in the face of accumulating data and growing anecdotal evidence, it had become received wisdom within the TB community that TB infection in London was climbing at an alarming pace (a 71% increase over the previous decade [Rose et al 2001]). *Tuberculosis control in London – The Need for change* (Thames Regional Directors of Public Health1998), laid bare the urgent need for improved coordination of service delivery and the need for TB to be taken seriously in London. Amongst its detailed recommendations are three potential models for organising services; iterations of these models are still under discussion today, evidence of both the model's robustness and of the inertia which has come to characterise TB control in London. The report also discussed results of a follow-up survey of members of the Working Party (see Appendix F), in which members were asked about the current status of TB

control in their geographical areas, two years after publishing their recommendations. The conclusion (p.3) was blunt:"...the survey has identified widespread difficulties in implementing these recommendations. It is unlikely that implementation of these recommendations is achievable within the current organisational structure". This organisational inadequacy is highlighted throughout the report: "the current service structure has been unable to respond effectively to the increasing problem of tuberculosis in the city" (p.2) and "the overall picture is one of a fragmented and under-funded service which has difficulty in meeting recommendations for good practice" (p.10). The report's executive summary concludes, "The rate of increase in tuberculosis cases in London demands that a process to improve services is taken forward rapidly."

Clearly, this did not happen. The issues identified 14 years ago, in what has become a seminal report, have been repeated in only barely modified form in most of the reports which have followed. Figure 21, below, illustrates.

Report	**Key Excerpts**
Improving TB Control in London (1999). [The official follow-up/response document to Tuberculosis control in London – The Need for change (1998).]	"There was a strong consensus among participants about the need for change" "TB control services in London should improve outcomes by working to consistent guidelines and quality standards" A call for "clear leadership" and "a London-wide group which will ensure consistency across the sectors"
TB Control in London: Next Steps (2001)	"TB continues to be an important public health issue for the capital" A major priority: "developing commissioning for London wide TB control services" "There should be a dedicated TB Manager working across London to lead the TB control project team..."
Tuberculosis in London (2003)	"...there is need for a broader, more coordinated approach to TB control across the capital which must include non-health public services such as Local Authorities and voluntary sector agencies" "More will need to be done to permanently reduce the level of TB in the capital. There is still a need for NHS organisations to work closely together..." "...services in London are fragmented..." "...the commissioning process for TB services is unclear...(and)complicated further by the many different organisations...which are involved" "Failure to heed the rising rates in London and to ensure adequate TB control now could result in major problems."
Stopping Tuberculosis in England: An Action Plan from the Chief Medical Officer (2004)	"Public health effort needs to be better organised...They need a... clear structure to work within and clear accountability" *(table continues on next page)*

Report	Key Excerpts
Tuberculosis prevention and treatment: a toolkit (2007)	"...if we are to contain the return of a disease over which we once had control...we strongly recommend that all PCTs plan for TB service provision." "There is at present a lack of clarity about how TB services are commissioned or procured"
An Audit Evaluation of Pan-London TB Services and Training Needs (2008)	"TB needs greater prioritization by commissioners" "Urgent consideration should be given to establishing a pan-London services network…to support more consistent strategic planning, co-ordination, sharing of best practice and responsive delivery of… services" "TB services teams should develop and formalize collaborative ways of working with non-NHS and voluntary sector organizations."
London TB Service Review and Health Needs Assessment (2010)	"The management of TB in London needs to become more standardised and a greater degree of central control applied. There is currently a complete lack of standardisation of clinical pathways of care across London. A manual of protocols and pathways for London is needed (based on the New York equivalent)" "performance monitoring needs to be centralised, and accountability for performance needs to be improved." "A London Board of TB Control should be established, whose prime objective should be to reverse the trend of year on year increase in TB incidence and in burden of disease. Membership…would need to be drawn not just from the NHS, but also from the Department of (Public) Health, from Local Authorities, from the office of the Mayor of London, from users of services, and from the third sector." "The need to improve control of TB in London is sufficiently pressing that action needs to be planned now and implementation begun, despite (NHS) organisational uncertainty." "The impression received is that of 30 services working in relative isolation, with little or no sharing of…good practice."
The Case for Change (2011) Model of Care (2011)	"The existing TB service model in London has not impacted on the rates of TB..." "There is the risk that the control of TB will become more fragmented as the responsibilities for protecting health and procuring services move into new and disparate organisations most of which will be unable to take a pan-London strategic view of the disease."

FIGURE 21: SELECTED EXCERPTS FROM VARIOUS COMMISSIONED REPORTS ON TB CONTROL IN LONDON

The two most recent reports, the Case for Change and the Model of Care, were produced by "London Health Programs" (the branch of NHS London which "hosts" the TB program), but were effectively written by the TB Clinical Working Group and Commissioning Board. The two documents are complementary. They have much in common with earlier reports in highlighting the alarming state of TB infection rates in London and issuing an urgent call for action. For an overview of the contents of these two key documents, please see Appendix G. Reading them it appears that today's organisational structure is no better positioned to respond effectively to TB than it was when the first report was written in 1998. What does set them apart from earlier reports, however, is that together they offer more detailed and specific recommendations for change than prior reports, along with a rudimentary attempt at

costing and calculating the current investment in TB control in London. Taken together, they comprise a detailed "policy alternative" as will be discussed in Chapter Eight.

The challenge, as so often has been the case, is securing a place on the NHS policy agenda when the entire system is again undergoing a massive restructuring. For instance, during the course of producing these reports, the established and agreed steps for advancing policy documents through the hierarchical NHS approvals process was constantly shifting. During the summer and early autumn of 2011 plans revolved around preparing to present the documents to the NHS London "Strategy and Innovation PLG", followed by a presentation to the "London Delivery Group". However, on 20 September 2011, just days before the first presentation was due to take place, the meeting was cancelled because it was decided by NHS London that the "Strategy and Innovation PLG" was now a redundant body in light of the shift to GP commissioning. The presentation to the "London Delivery Group" was still to take place, but the scheduled October meeting of this group was also cancelled. Eventually, it was concluded that the "London Delivery Group" was also obsolete, so the presentation to this body never took place either. Minutes from the 20 October 2011 Clinical Working Group meeting observed:

> *Following recent changes to the sign off process within NHS London it is unclear what the final sign off process for the case for change (and Model of Care) will be. Until this paper has been approved it is not to be disseminated to a wider audience.*

Despite this uncertainty, all efforts became focused on presenting these strategy documents at an upcoming meeting of Cluster Chief Executives. Again, after three false starts, including cancelled meetings or the TB item being bumped from the meeting agenda, the presentation finally occurred in January 2012. TB Commissioning Board Minutes from the 3 February 2012 meeting report the following:

> *The Cluster Chief Executives supported in principle the CfC (Case for Change) and MoC (Model of Care). However they suggested that they were not the right group to make the full financial commitment to implementing the model. The CCEs recommended that the MoC should be presented to the GP Council.*

This decision resulted in deep annoyance and frustration amongst Commissioning Board members, prompting one of those who had made the presentation to the Chief Executives to comment that he was "pissed off" at their decision. At the time of writing, eight months after this decision by Cluster Chief Executives, London's TB control strategy, as outlined in these two documents, continues to languish.

To summarise, the themes which arise consistently throughout the 14 reports are:

1. clear acknowledgement regarding the extent and seriousness of resurgent TB across London
2. the extensive fragmentation within the system and the problems it causes, including
    a. a lack of consistency in care across London;
    b. a resulting need for enhanced co-ordination of services with commissioning being undertaken on a pan-London basis; and,
    c. a need for accountability at a system-wide level.

"ACTION REQUIRED: Not Applicable"

Despite the plethora of research, analyses, reports, recommendations for action and various groups dedicated to tackling TB in London, very little seems to actually *happen*. One respondent likened the situation to "wading through treacle" in terms of making any changes at a system level. Another interviewee who had left the system out of frustration - one of several research participants who had made a similar decision - characterised efforts during the late 1990s to the late 2000s as "just a decade of discussion", noting, "sixteen years after the WHO called a global emergency, sixteen years, and we're still talking". Another noted, with great, albeit rueful, hilarity, the inside cover of the 2004 Chief Medical Officer's report, *Stopping Tuberculosis in England: An Action Plan*. In the box specifying "Action Required", the response is "Not Applicable".

This research uncovered a clear pattern of rehashing and repeating recommendations in report after report, but with limited implementation. As noted, this research observed the process of producing the 2011 Model of Care and Case for Change documents. This effort took almost a year and consumed vast hours of discussion and clinicians' and managers' time. The contents of the final documents, however, could have largely been trawled from previous reports. For example, the 2007 DH document, *Tuberculosis prevention and treatment: a toolkit* described in detail "a tiered model of commissioning" which is largely similar to the one eventually (re)produced in 2011 in the Model of Care. The 2010 PHAST report also discussed the utility of such a model and recommended its adoption.

A similar scenario was observed involving hours of discussion, over many months, on the merits of adopting a pan-London model of commissioning TB services, rather than commissioning services on a PCT-by-PCT basis, as is largely the case now. As illustrated in Figure 21, the value of adopting a pan-London commissioning approach had been

identified consistently, starting with the 1998 report, as a means of addressing the damaging fragmentation of services which characterises TB control in London. There was scant opposition to the idea of pan-London commissioning during Model of Care/Case for Change discussions, and its adoption was eventually recommended– again. But this did not prevent the topic consuming significant amounts of time and resources. Occasionally during meetings participants would observe that various topics under discussion were suspiciously similar to something which had already been addressed in previous documents. Such observations would simply be acknowledged and the discussions would resume, unabated.

Summary and observations

Much is known about the epidemiology of tuberculosis in London, along with how its resurgence might best be brought under control. One of the leading contributors to the PHAST report remarked that in all his years of working in public health consultancy in the UK and abroad, he had never worked on a project in which there was so much "off the shelf" material available to inform his work. There has been a great deal of action – numerous reports and studies, working groups, committees and boards - but very little improvement to show for it. So, whilst it is abundantly clear what needs to be done to tackle resurgent TB in London, it never happens. The majority of the 14 reports cited above were either produced or commissioned by some wing of the NHS, resulting in the curious situation of the NHS repeatedly telling itself what to do but never actually doing it.

It is posited that this failure to implement policy relates to a combination of:

1. TB occupying a low place on the public health agenda, which itself ranks lowly on the overall London healthcare agenda;
2. the closely related issue of an absence of accountability and leadership, as will be discussed in more depth in Chapter Eight;
3. ongoing, and often significant, organisational restructuring within the broader NHS which stymies efforts at advancing proposed changes in how London controls TB;
4. little organisational capacity for co-adaptation or learning, making change difficult
5. lack of systemic capacity to change as a whole;
6. an excessive number of boundaries, leading to turf squabbles; and,

7. a fragmented and misaligned structure with very little integration and no co-ordination.

The objective of this section was to outline the historical and organisational context of this research, building from the epidemiological overview of TB in London presented in Chapter Two. The remainder of the chapter will examine, in comparative case study form, the differences between New York City's and London's organisational responses to TB control.

Case Study One: An International Comparator Between Tuberculosis Control in New York City and London

As discussed in Chapter Two, New York City's approach to tackling its TB resurgence differed dramatically, and produced dramatically different results, to London's. This difference in approaches is partly attributable to differences between the American and British healthcare systems; however, much of this was neutralised early on in the epidemic when TB treatment in New York City became free to all patients, even in private clinics (well before TB medicines were free to all TB patients in the UK, which happened only about a decade later). As previously discussed, London's TB rate has been on an almost constant upward climb since 1988, with infections increasing 71% between 1988 and 1999 (Rose et al 2010), and continuing to climb almost yearly since then. In contrast, New York City's TB rate has fallen by 82%, from the height of its epidemic in 1992, as seen in Figure 22. Even more remarkably, its rate of MDR-TB has decreased by 97%, while London's rate is increasing at an alarming pace. The remainder of this mini case study will describe the contrasts between the two cities, discussing the significant structural, organisational and operational differences which characterise the two systems, and how longstanding ambivalence in London toward emulating New York City's approach to TB control may finally be softening.

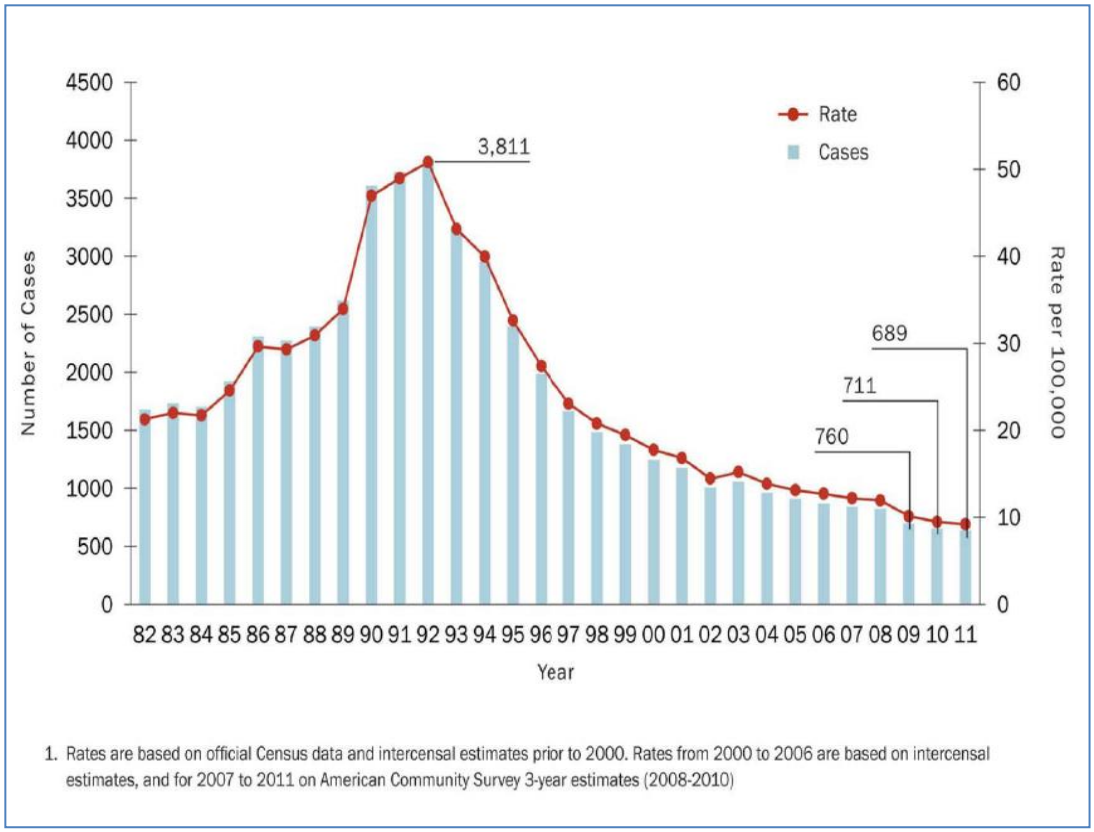


FIGURE 22: TUBERCULOSIS CASES AND RATES, NEW YORK CITY, 1982-2011. SOURCE: NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE (2012)

Like London, New York City was also initially slow to react to the re-emergence of TB – it took from 1987 until 1992 to put a clear plan in place (Hayward and Coker 2000). But once they started, officials tackled the disease with focus and ferocity, backed by high level political support that is still absent in London today. This included a dramatic and rapid increase in resources given to the Bureau of TB Control: a quintupling of staff, to 841, and a ten-fold increase in their operating budget to $781 million (USD) (Kambili 2010) (contrasted with the approximately £25 million per annum estimated to be spent in London [NHS London 2011 [b]]). Today, the Bureau still employs 300 personnel, despite the low rate of TB infection in the city, reflecting a key learning from the early days of the epidemic when staffing levels and infrastructure had been allowed to deteriorate to dangerously low levels (Kambili 2010). As cited earlier, London's TB infrastructure had also been allowed to deteriorate and the city was ill-equipped to

deal with TB's comeback. However, unlike in New York City, this has not resulted in any increase in funding or other resources. The number of staff working on TB control in London today is estimated to be between 200-250, employed by approximately a dozen different employers spread across 31 boroughs, and treating approximately 3500 new cases of TB yearly. In contrast, New York City's 300 TB control staff treated 689 cases in 2011. Consequently, resource and staffing shortages may well be a factor impeding London's efforts to control the disease.

Nine initiatives, delivered from within its centralised Bureau structure, are seen as key to New York City's success (New York City Department of Health and Mental Hygiene (2009) :

1. Free, high-quality care
2. Enhanced case management of *all* (emphasis added) confirmed and highly suspected cases of TB
3. Provision of Directly Observed Therapy (DOT)
4. Extensive outbreak investigations conducted by highly trained teams
5. Rigorous contact investigations for all infectious TB and all paediatric TB
6. A TB shelter for homeless TB patients
7. Improved infection control within institutions (especially homeless shelters, prisons and hospitals)
8. Improved diagnostics services
9. Cohort Review

The table below provides a simplified overview of the extent to which New York City's key success factors are also evident in London.

Key Success Factor in New York City	In Place in London	Partly in Place Across London	Not in Place in London
Free, high-quality care	√		
Enhanced case management of *all* (emphasis added) confirmed and highly suspected cases of TB			√
Provision of Directly Observed Therapy (DOT)		√	
Extensive outbreak investigations conducted by highly trained teams	√		
Rigorous contact investigations for all infectious TB and all paediatric TB		√	
A TB shelter for homeless TB patients			√
Improved infection control within institutions		√	
Improved diagnostics services			√

Cohort Review		√	

FIGURE 23: EXTENT TO WHICH LONDON SHARES NEW YORK CITY'S KEY TB CONTROL SUCCESS FACTORS

From amongst these nine factors, only two, the provision of free care and extensive outbreak investigations, are fully in place in London. The remaining seven key success factors which are not fully in place, with the possible exception of improved diagnostic services, are inter-related. The DOT program is perhaps the single most important factor, as it leads to a number of positive consequences, including fewer infectious patients entering institutions like hospitals, shelters, and jails (Frieden et al 1995). The benefits flowing from this, in turn, include a reduced need for enhanced case management, fewer TB shelter beds, and fewer resource-intensive contact investigations, making DOT the start of a virtuous cycle in TB treatment.

Improved infection control within institutions is an important corollary to DOT. In London, fewer hostels now use large dormitory-style rooms and there are also now sufficient numbers of negative pressure facilities in hospitals, both helpful components in controlling the spread of TB. The situation in prisons, however, continues to be cause for concern, despite significant changes made over the past decade in how the UK prison system responds to TB. This will be discussed in detail in Case Study Two.

Directly Observed Therapy (DOT)

DOT involves a healthcare professional or social care worker watching patients swallow their TB tablets, anywhere from three to seven days per week. Whilst not universally embraced as superior to other treatment methods (Coker 2000:8-10), it is widely recognised as the preferred approach for administering TB treatment and is the method endorsed by the World Health Organisation. In the UK, DOT is additionally recommended by both NICE and the British Thoracic Society for all patients with one or more "social risk factors" which make it more likely they will not complete their full course of TB treatment. DOT's value is that it is seen to significantly improve the rate of treatment completion, thereby lowering the risk of drug resistant TB developing later, as well as the onward transmission of the disease. In New York City, its application is seen as pivotal to the city's successful TB control program (Friedan et al 1995, Gandy &Zumla 2002, Paolo and Nosanchuk 2004), especially its success in combating MDRTB. Increased use of DOT was also a focus in Barcelona's previously cited successful TB

control campaign (Rodrigo et al 2001), and in China, India and Bangladesh (Gandy & Zumla 2002).

Patients with one or more social risk factors, such as being homeless, drug dependent or with a history of imprisonment, are less likely to complete their full course of TB treatment. In Barcelona, DOT was aggressively expanded, although they failed to reach their target of covering more than of 90% of the at-risk patient population (Rodrigo et al 2001). And in New York City fully 76% of the "eligible" TB patient population (in effect the entire TB patient population), were receiving DOT in 2008, up from approximately 2% in 1984 (New York City Department of Health and Mental Hygiene 2009). In that city, *all* patients diagnosed with TB – including professionals, those with stable personal backgrounds, young or old, with social risk factors or without - are automatically put on DOT, and it is the exception and not the rule that the patient stays on the program until treatment completion. This also eliminates the stigma sometimes associated with being a "DOT patient".

London currently uses DOT for 8.5% of its TB population (NHS London 2011 [a]). As mentioned above, NICE guidelines advocate DOT for all patients with one or more social risk factors, but this guidance is clearly not followed in London where less than one-third of at-risk cases receive DOT (Health Protection Agency2011[a]). NHS London acknowledges wide variation in the usage of DOT across London, with some TB clinics not even offering DOT outside of regular working hours, a likely result of the notable absence of a pan-London DOT protocol (NHS London 2011 [a]).

But Potential Change on the Horizon?

The current state of DOT in London reflects a historically deep ambivalence amongst members of the London TB community toward the program, observed during the course of this research. However, resistance seems to be lessening at the time of writing, perhaps a consequence of the positive experience of implementing the Cohort Review process in London, another "imported" idea. It is not clear whether the aversion to DOT in London is a defensive reaction, trying to justify why its rates of application are so low when it is the approach recommended by NICE, the WHO, the British Thoracic Society, and numerous published studies, or whether there are genuine misgivings in London about the program's efficacy. It may also be an instance of self-organisation within the system working to maintain the status quo, even when the status quo is detrimental to improvement, a phenomenon discussed more in Chapters Eight and Nine.

Nonetheless, the recent Model of Care document does, finally, offer a draft pan-London DOT protocol, which, if enacted, compels providers to offer DOT up to seven days a week, to anyone who is deemed at risk of not completing treatment. Whether the protocol will be put in place remains to be seen, and there is clearly some doubt as to whether this will be the case. One of the most senior figures in TB in London, one who in most other organisations would have the authority to ensure that protocols such as DOT are enacted, observed, "DOT will be a really, really interesting thing to see what happens because we are very clear now, I think, with what we expect. And I'll put money on the fact that it won't happen in half of London."

This comment reflects a significant structural shortcoming within the London system: that a person one would expect to have the power to make things happen is almost devoid of such authority. This system-wide lack of accountability and responsibility is a serious and significant weakness which impedes TB control efforts. This issue of accountability will be discussed at greater length later. However, it draws attention to another significant difference between the New York City and London TB control systems; namely, their organisational structures.

Organisational Structures in London versus New York City

The two cities strongly contrast with respect to the manner in which their TB control systems are organised. In London, the system is highly fragmented, comprised of multiple organisations, each with its own set of priorities and accountabilities, and with no obvious locus of control or accountability, as seen in Figure 24 below.

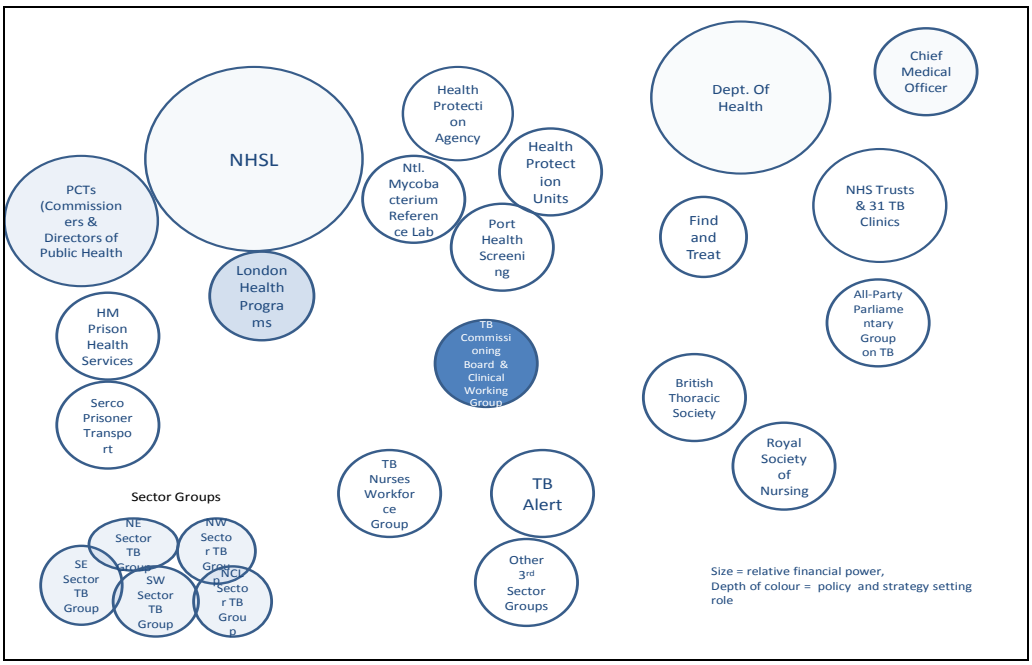


FIGURE 24: A SCHEMATIC REPRESENTATION OF THE TB CONTROL SYSTEM IN LONDON

In contrast, New York City's system is vertical, hierarchical, and with a clear point of accountability, as can be seen schematically in Figures 25 and 26 below.

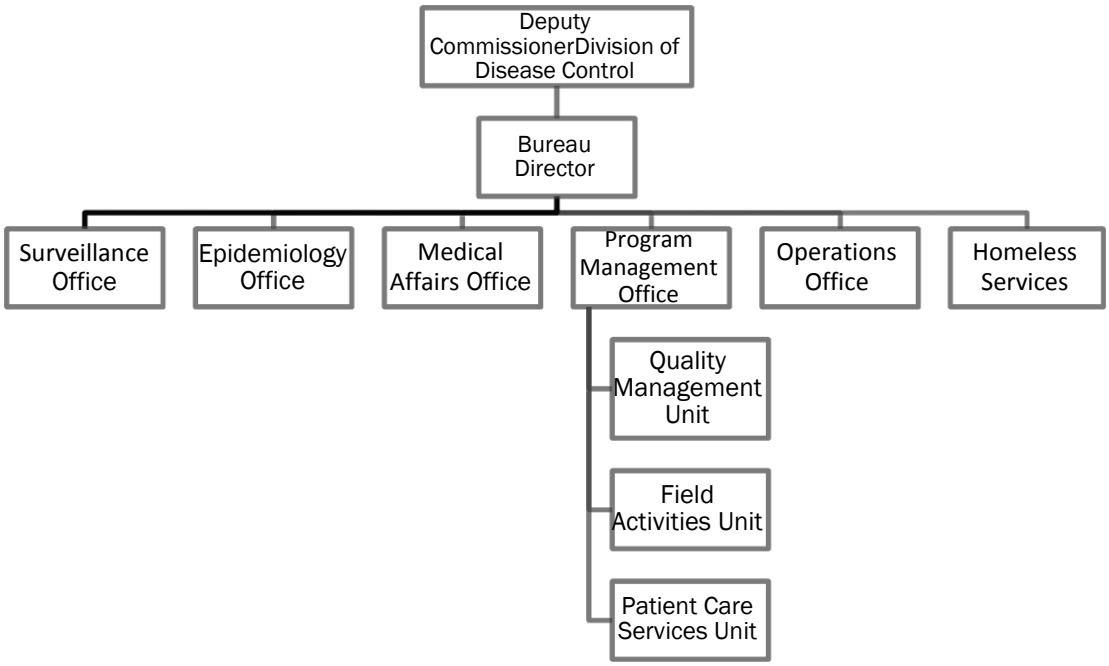


FIGURE 25: ORGANISATION CHART, BUREAU OF TB CONTROL, NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE (SOURCE: KAMBILI 2010)

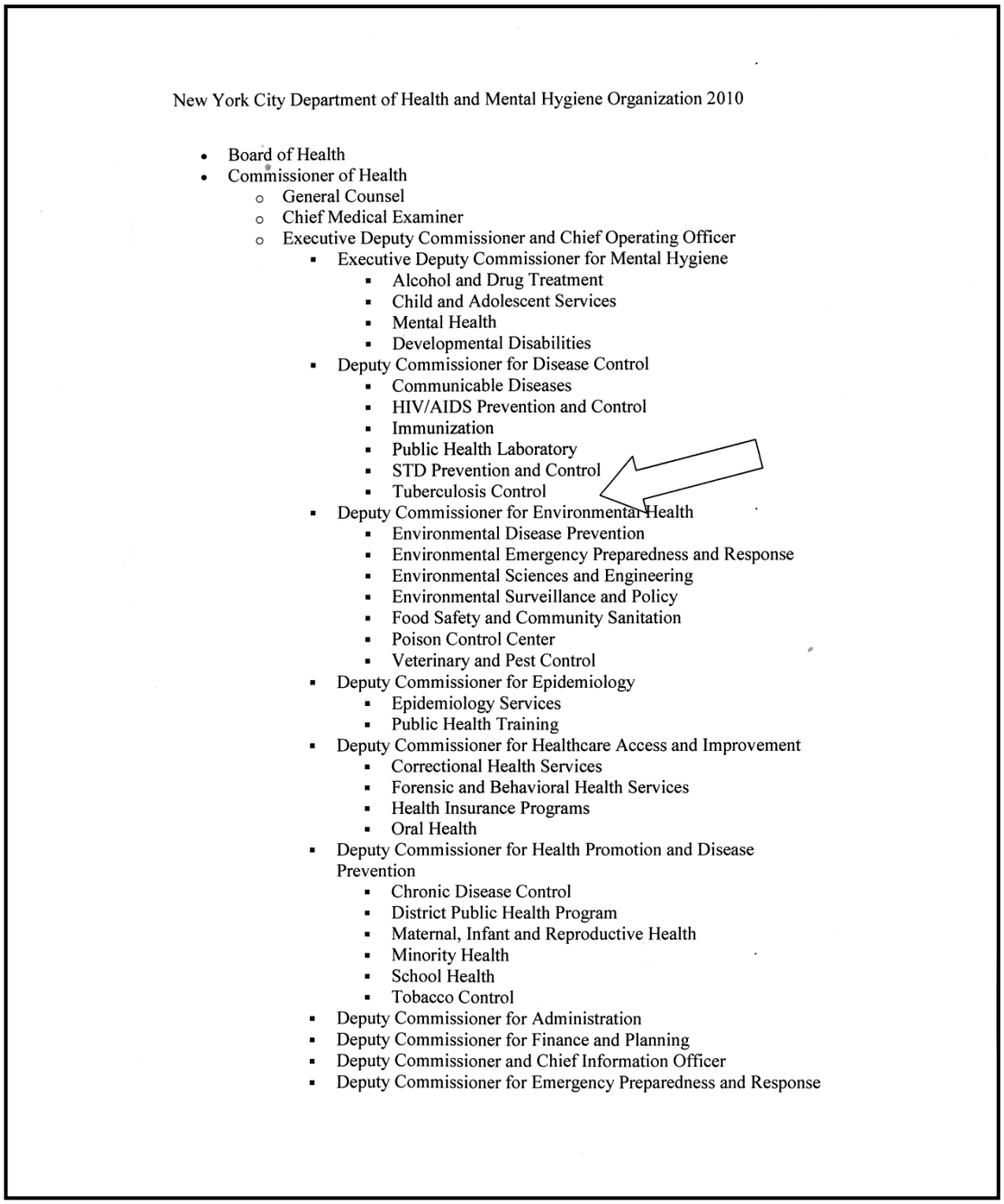


FIGURE 26: NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE ORGANIZATION 2010 (SOURCE: KAMBILI 2010)

The UK and US have vastly different healthcare systems and models of government. The federal government in the US has devolved more powers to local governments than is the case in the UK, giving US states and cities a greater degree of law-making authority than in the UK. The New York City Department of Health, headed by a Commissioner appointed by the Mayor, who in turn is directly elected by the people of the city, has a staff of 6000 and a budget of $1.6 billion (USD). The New York City Department of

Health formulates strategies for public health, including TB, promulgates local public health laws (as long as those laws do not contravene national or New York state laws), and creates and implements activities to address public health needs (Kambili 2010). As seen in Figure 26 above, it is within this structure that the New York City Bureau of Tuberculosis Control is located, illustrating the Bureau's authority and accountability. While this organisational structure differs significantly from that found in London, NHS London does have comparable authority, at least from a regulatory, if not a legislative, perspective, which it could use in addressing the city's TB problem. Organisationally, however, the two systems are miles apart.

London's TB control system reflects two and a half decades of NPM-influenced healthcare reforms in the UK, which, coincidentally, took hold at approximately the same time as did the resurgence of TB in London, as will be highlighted in Chapter Eight. These reforms have led to a highly dispersed and often misaligned system. This situation has arisen in part from NPM's goal of pushing decision making down to the lowest possible level and disaggregating once powerful departments like Health into arms-length organisations such as the HPA. Simultaneously, numerous services and functions formerly provided by major departments such as Health are now outsourced to external for-profit and not-for-profit organisations, such as TB educational outreach (now often provided by the charity TB Alert), and laboratory and prisoner escort services (now provided by the for-profit private contractor Serco). And despite the usual NPM penchant for top-down decision making and control, the TB control system in London is devoid of a centralised point of control, clear decision making and accountability structures, and any evidence of top-down management control or interest. By comparison, in New York City, authority and decision making are centralised and the organisation is verticalised and hierarchical, as seen in Figures 25 and 26. There is limited outsourcing of functions, with the Bureau providing a hierarchical, though holistic and highly accountable, system of TB control.

In stark contrast to New York City's single "Bureau" structure, this research determined that there are almost 70 distinct entities, most of them multifaceted, stand alone organisations in their own right, significantly implicated in TB control in London (Figure 24). These bodies are largely drawn from the public sector, but also include private sector (prisoner transport services, laboratory services), third sector (TB Alert and other charities), and, until recently, a social enterprise (the original Find and Treat team). Many, but not all, are involved in delivering care to TB patients and many, but not the majority, are members of the London TB Commissioning Board and/or the

London TB Clinical Working Group. These two important bodies were established in 2008 with the goal of developing a TB strategy for London and, ultimately, reducing TB levels. Corollary benefits were meant to include bringing together the varied and dispersed organisations working on TB control in the city in an effort to address the problem with fragmentation of TB services, as well as sharing best practices and better co-ordinating efforts across the city. The Clinical Working Group functions in an advisory capacity to the TB Commissioning Board on clinical matters and has a larger membership than does the latter group. Unlike formal Managed Care Networks within the NHS (for stroke and cancer, for instance), the London TB control system, most notably the TB Commissioning Board, has not been granted any authority, accountability or budget-holding power by the NHS or the DH. In practice, the Commissioning Board relies on persuasion and goodwill in achieving its objective of lowering TB rates in London. It possesses neither a carrot nor a stick in terms of compelling TB service providers or commissioners to respond to its directives, resulting in significant incongruence between its objectives and its means, its form and its function.

By placing its Bureau of Tuberculosis Control within the Department of Public Health, New York City has clearly chosen to follow a public health model in its TB control efforts. Again, this provides a contrast with London where most respondents in this research expressed concern that the system in London is overly bio-medical, with insufficient attention focused on the broader determinants of health and other public health concerns. This sentiment crossed professional lines:

> *They've (TB clinic staff) had such similar training and... experiences, they're very kind of fixed...some might say narrow, in terms of perspective on everything else apart from that "clinician and case notes" environment... there's not much knowledge of what goes on outside of that hospital clinic setting* (TB Outreach Worker)
>
> *...some of the public health leads for London...they're notorious, until recently, for not being interested in tuberculosis.* (Senior TB consultant)
>
> *I think the public health aspects are not really very well addressed yet. I mean we try to do contact screening but TB nurses are not public health trained...it's not within their remit actually. They're not paid to do community work, they're paid mostly by the Trusts...to look after the patients...So that's what's missing.* (Consultant in Communicable Disease Control)

The table below offers a summary overview of some of the key organisational and structural distinctions between the TB control systems in London and New York City.

Key Organisational and Structural Features	New York City	London
Accountability	Clearly delineated lines of accountability	No obvious point of accountability, aside from the clinical accountability of physicians.
Organisational structure	Vertical, integrated and hierarchical. Bureau is sole employer of its Chest Centers staff.	Highly fragmented and dispersed with dozens of employers operating across London's TB system.
Funding	Annual budget based on the goal of eliminating TB in the city; consequently, it includes funding for case finding, screening activities and subsequent prophylactic treatment, and general costs associated with TB treatment	Funding for TB services is at either the sector, or more commonly, the borough level and comprises an unallocated "pot" of funds, often as part of a broader respiratory medicine budget, and based on treating projected number of active TB cases in the acute trusts' 31 TB clinics. No known dedicated funds for active case finding and prophylaxes. Despite a significant recent investment of time and effort, the London TB Commissioning Board was unable to determine with any precision how much is spent annually on TB across the city.
Budget holding	Centralised with individual budget holders able to exercise decision making powers and influence policy decisions commensurate with the size of their budgets	No central budget holder, budget powers are widely dispersed. No obvious correlation between budget holding and relative policy influence or engagement (i.e., DH and NHS largely absent).
Holistic focus	Yes. Relevant social services, such as services for immigrants, refugees and the homeless, including running a homeless shelter. Bureau also provides educational outreach materials, along with HIV community outreach.	No. Highly medicalised approach with a commissioning focus. No representation of migrant or high-risk ethnic communities. Outreach services scarce and provided randomly at borough level. Limited, ad hoc contact with housing officials. Educational efforts largely outsourced to the charity TB Alert.
Leadership style	Top-down	Unclear. Scant evidence of leadership being exercised at any level aside from within some clinics.
Compliance	Via monitoring and control as the Bureau itself provides virtually all required TB services	Largely unmonitored due to weak contracting regime between purchasers and providers.
Engagement with external, including non-healthcare, stakeholders	Extensive, including formalised relations with private healthcare providers and various ethnic groups, as dictated by infection rates and/or outbreaks	Often perfunctory, aside from outreach to certain ethnic communities with high rates of TB infection

FIGURE 27: ORGANISATIONAL AND STRUCTURAL FEATURES OF TB CONTROL IN NEW YORK CITY AND LONDON (BASED LOOSELY ON QUINN & MCGRATH [1985] AND FREDRICKSON [1986])

Although there may have been incredulity in London in the early 1990s regarding the reversal of previously declining TB rates, there was a sharp awareness within London's medical community that New York City was in the throes of a serious and deadly resurgence of the disease, and of the need to avoid a similar catastrophe (Ormerod et al

1994, Evans 1995, McEvoy & Maguire 1995). In 1999 more than 160 healthcare experts met in London to analyse their city's approach to TB as contrasted "against the public health response of New York City's Bureau of Tuberculosis Control" (Hayward & Coker 2000). Also, amongst the previously cited 14 reports written about TB in London, the "New York City phenomenon" is sometimes highlighted, but often, particularly in reports written before 2010, with an emphasis on how the approach used there would not be suitable for London (with different immigration patterns and higher MDRTB in New York City often cited as reasons). Tuberculosis officials in London were, and to some extent, remain, sceptical about the extent to which they might learn from New York City's approach and tactics. One respondent observed:

> *you got a sense there was a general antagonism or resistance to being critiqued by an outsider…I suggested was that we draw on New York's experience by perhaps inviting [name redacted], to come and speak. And also maybe to conduct an audit of London TB, and that was rejected outright because this view, you know, 'what do we want, (them) coming to evaluate our program? (Senior TB Consultant)*

This reluctance to critically examine expertise from New York City was eventually (mostly) overcome, with two interesting outcomes:

1. the implementation in London of the "Cohort Review" process, which will be discussed in greater depth in the next chapter, in Case Study Four; and,
2. serious consideration amongst London's TB healthcare and policy experts regarding implementing a more holistic, centralised model of TB control, as embodied by the New York Bureau of Tuberculosis Control.

In 2010, the "London TB Service Review and Health Needs Assessment", better known as the "PHAST Report", (as it was commissioned from the consultancy Public Health Action Support Team), was effusive in its praise for the centralised, holistic approach to TB control taken in New York City. The report recommended that London's existing TB *Commissioning* Board be replaced by a TB *Control* Board. As implied by the new name, a Control Board's mandate would be all-inclusive and would include representation from the Mayor of London's Office, Local Authorities, social services (especially housing), and the third sector; in sum, a broader public health and population-based perspective. The top 3 recommendations contained in the PHAST report focused on this issue:

1. Establishing a Board of TB Control for London should be considered. Similar to the approach adopted in New York, the Board would be responsible for achieving the overall objective of a year on year reduction in the incidence of TB in London. The Board would also be the central point of accountability of services for their performance against agreed standards of TB prevention, care and control.
2. A Board of TB Control would deliver its objectives through:
    - Standardisation of TB prevention, care and control, with agreed care pathways and performance measures;
    - A robust and consistent management approach, including the commissioning of TB services across London;
    - Transparency of performance;
    - Accountability for delivery;
3. Membership of a Board of TB Control for London should not be restricted to the NHS. It should comprise representatives of London's TB services, expertise in public health, specialist and GP commissioning, together with users, community and third sector (London TB Service Review and Health Needs Assessment, 2010)

In late 2010, shortly after this report was issued, the head of the New York City Bureau of Tuberculosis Control, Dr. Chrispin Kambili, was invited to speak to the All-Party Parliamentary Group on Global Tuberculosis and to meet with NHS London and the HPA. This visit further underscored a new openness in London toward learning from New York City's experience, which had started in earnest with a group of nurses visiting New York City in 2009 and learning about their "Cohort Review" process. Dr. Kambili's visit added to a growing enthusiasm about the prospect of London moving toward a centralised "Bureau-like" model for managing TB, as per the PHAST report. As part of this research, many of Dr. Kambili's interactions with London TB officials were observed, including hearing the advice and recommendations which he shared. His presentations were compelling and meeting participants were clearly engaged and interested. Whilst the content of Dr. Kambili's message was barely changed from what had been known and available to the London TB community for over a decade (Frieden et al 1995, Hayward & Coker 2000), and via various public reports from the New York City Bureau of Tuberculosis Control, having those messages reiterated by someone with Dr. Kambili's stature, experience and passionate belief in New York City's approach was powerful. For the weeks and months following Dr. Kambili's visit, there were numerous instances where his comments were repeated in meetings, along with frequent, positive references to the way things were done in New York City.

During the last quarter of 2010 and the first quarter of 2011 many of the recommendations contained within the PHAST Report were gaining traction. Most

notably, the TB strategy developing within the TB Commissioning Board and the Clinical Working Group[13] during this period was centred on the idea of establishing a "London TB Control Board", modelled closely on the New York City Bureau of Tuberculosis Control. Indeed, as late as March 4th 2011, in a document prepared by the TB Commissioning Board for discussion at their monthly meeting of that date, the concept of a Control Board was being promoted:

> *the establishment of the Board would emulate the successful approach developed by the New York City Bureau of Tuberculosis Control…Membership of the Board will need to consist of the following organisations…:*

- *Office of the Mayor of London*[14]
- *Department of Public Health (as was envisioned at the time)*
- *Local Authority*
- *NHS (commissioners, primary care and provider services)*[15]
- *Social Services*
- *Voluntary and community services*
- *Service users*

This broad enthusiasm for the establishment of a "London TB Control Board" was highlighted by representatives from the London TB Commissioning Board at a meeting observed by this research in the House of Lords of the All-Party Parliamentary Group on Global TB on March 3, 2011. This was followed by the formal adoption of the recommendation by the TB Commissioning Board itself during its regular monthly meeting, held on March 4, 2011 (referenced above). However, by the next Commissioning Board meeting on April 8th 2011, the idea was unexpectedly rejected. Whilst the reasons for this abrupt reversal remain unclear, it appears to be largely the result of a mid-level staff change at NHS London, arising from ongoing NHS restructuring. At any rate, sometime between March 4th 2011 and April 8th 2011 a new manager with responsibility for the TB file appeared and took his place on the TB Commissioning Board, replacing a well-regarded, yet short-tenured, predecessor. With the arrival of the new manager, the tone and content of the argument emanating from

[13] This plan eventually became the "Case for Change" and "Model of Care", Reports 13 & 14 in Figure 17

[14] The Mayor of London's office was lukewarm, at best, in its support for the Control Board concept and for participating on such a body. When presented with the idea by a senior Commissioning Board representative, a senior official from the Mayor's Office asked if the Commissioning Board representative really wanted to sit in front of the Boroughs and share such bad news (i.e, TB rates), "airing the NHS' dirty laundry". This apparent lack of enthusiasm was later cited on several occasions by the NHS and Commissioning Board representatives when justifying their decision to scrap the Control Board idea.

[15] Field notes from October 2010 indicate that from the moment they were presented with the PHAST report, senior public health leadership at NHS London expressed concern about the media attention which might result from establishing a Control Board, fearing its establishment would draw attention to London's TB problem and politicise the issue.

the NHS was that if TB control was ever to become a priority for NHS London, it must fit within the standard NHS-wide commissioning processes, and that the holist language of a Control Board was inappropriate. The new manager making this argument observed "if I were cynical I'd say a Model of Care document (the TB strategy document under development) is one that sits on a shelf", whereas a commissioning document is really used. And with that observation, the concept of a London TB Control Board was effectively abandoned.

During this meeting it was clear that some members of the Commissioning Board, namely those from NHS London, were aware that the new manager would be making this move to set aside the Control Board concept. It is unlikely he could have done so without at least some senior level support. But the feeling amongst other members of the Board in attendance at that meeting was one of disbelief. In informal discussions following the meeting some members, especially medical and public health consultants, indicated they were so taken aback by this move that they were not even able to challenge it during the meeting. This decision to abandon the pursuit of a New York-style TB Control Board was taken swiftly and unilaterally, resulting in considerable, though short-lived, consternation, particularly among non-NHS members. Interestingly and contrary to the theory of professional dominance, even senior consultants quickly acquiesced, although there was broad support amongst them for the Control Board concept. By the next monthly meeting of the TB Commissioning Board on May 6th 2011, the term "Control Board" is nowhere to be found in either pre-meeting materials or the resulting minutes. The minutes from the May meeting state:

> *There was some discussion around the advantages and disadvantages of using New York as an example. The TB Project Team (led by the above-noted newly arrived manager) agreed to highlight the differences as well as the similarities...*

Informal discussions in the following weeks and months were held with key Commissioning Board members who appeared to support setting aside the Control Board concept. The overall impression gained was that when the new manager, who had no prior background in TB, arrived, he vigorously questioned the viability of a New York City-style Control Board. This apparently resulted in something akin to a collective "wake up call", with NHS London representatives on the Commissioning Board asking themselves, in effect, "what were we thinking?"

Curiously, however, the final version of the Model of Care, dated November 2011, includes the control board *concept*, with the suggestion that a new TB Commissioning

Board should also "act as a board of TB control", with mention of broadening its membership along the lines of the original Control Board recommendation. This is peculiar. Once the original Control Board concept was quashed in April 2011, as discussed above, there were no observed instances of the Control Board, or the general concept underpinning it, re-emerging as an option during either TB Commissioning Board or TB Clinical Working Group meetings. Based on these observations as well as with discussions with members of these groups, it is assumed that the Control Board concept remains effectively shelved.[16] Speculatively, the language in the final version of the Model of Care likely reflects feedback received during the formal consultation on the document, in which external parties were invited to comment. It may also represent an attempt to acknowledge the widespread support amongst members of the TB Clinical Working, in particular, for the Control Board concept.

At the time of writing this thesis, the 2010 PHAST Report, with its key recommendations for establishing a Control Board, appears to be heading for its place on the shelf beside the eleven previous reports on TB control in London. Similarly, the Model of Care and Case for Change have been unable to gain the necessary endorsements from senior NHS London management to move ahead, meaning they are also on course to join this growing collection of disused and forgotten reports. This latest setback has been officially attributed to ongoing fall-out from current NHS restructuring. Perhaps most remarkably, apparently there is emerging discussion about the need to commission yet another "needs assessment" report.

The state of upheaval in the NHS is such that it remains unclear as to how any changes to the current structure and organisation of the TB system will manage to proceed. Meeting minutes since mid-2011 invariably contain references to various NHS bodies meant to play a role in sanctioning a newly reconfigured TB control system having dissolved and replaced with another body, or simply disappearing. During a TB Commissioning Board meeting in August 2011 when "next steps" were being discussed, a senior NHS manager observed, "I don't know the commissioning landscape anymore and TB is not sitting comfortably anywhere...from where we kicked off two or three years ago the world looks very different".

[16] And at any rate, the Model of Care and Case for Change policy plans are not moving ahead

Summary and Observations for Case Study One

This (mini)comparator case study has provided an overview of the structure and operation of the TB control systems in London and New York City, including London's deep ambivalence toward embracing important learnings from the New York City experience.[17] The vignette has also highlighted the significant differences between the TB control systems in the two cities, illustrating that New York's approach has been significantly more successful. The reasons identified as responsible for this difference are operational – the widespread use in New York City of the DOTS regime and Cohort Review (as will be discussed in Chapter Seven)– and organisational and structural – New York City has a highly verticalised and centralised TB control system with clearly defined accountabilities, leadership and political support. This mode of organising stands in sharp contrast to London's highly diffuse and fragmented structure with its absence of leadership and accountability. TB control in New York City is seen as important and is firmly ensconced as a vital component on the City's public health policy and political agendas. These issues of fragmentation, an absence of accountability and leadership, and the role of public policy priority setting will be examined in depth in later chapters.

With regard to complexity theory, the ambivalence in London toward embracing learnings from New York City may arise from a form of self-organisation which seeks to maintain the status quo and protect entrenched interests, rather than working toward change and innovation. This manner of self-organising is reinforced by the NHS' previously cited aversion to risk and its focus on control. Complexity theory's concept of non-linearity was also observed, but, as with the sort of self-organisation just described, it too, appears as a negative force within the system. Despite extensive investment in studying and analysing the best way forward (in the form of the 14 reports cited above), the system has not responded. Two other complexity theory precepts are notable by their absence in London's system: diversity amongst system components, relative to that found in New York City, and an inability by the system to co-evolve with, and adapt to, its changing environment (i.e., rising TB rates).

[17] Relatedly, during a meeting of TB nurses held in December 2010, a highly experienced Dutch nurse recounted to the group how she had made a presentation to London TB physicians in 2000 regarding an innovative and successful DNA fingerprinting project being undertaken in the Netherlands. She was thanked for her presentation, but told that it was of limited applicability in London as the city did not really have a problem with TB.

The preceding section has also highlighted the real impact on the TB control system of the constant restructuring which has come to characterise the NHS. This research captured firsthand how these ongoing initiatives impede, even foil, efforts at bringing change and improvement to the system. This, too, will be illustrated at greater length in the following chapter.

The next chapter will present three more worked case studies, each providing empirical evidence of various complexity theory and NPM concepts. A key empirical finding regarding the lack of policy priority accorded to TB control, which arose inductively from the research, is also discussed.

Readers will also note the continuing lack of empirical evidence for the theory of professional dominance within London's TB control system.

CHAPTER SEVEN: Empirical Findings: Part Two

Introduction

This chapter presents a series of "mini" case studies, with the objective of illustrating key events, scenarios or relationships within London's TB control system. As discussed in the Methods chapter, mini case studies, or vignettes, have been chosen to present most of the empirical data because they illustrate the systemic relations amongst and within the subsystems which comprise the broader TB control system in London. They also facilitate cross-case comparison. Understanding relationships is vital when undertaking complexity theory-based research, and comparison has been noted as a useful tool (Byrne 2009:3,5).

The chapter also presents a key inductive finding from the research related to the low priority accorded to TB control. This empirical finding will be explicated and discussed in the final section of the chapter.

The first case study in this chapter revisits the issue of drug resistant TB in London, focusing on a significant and ongoing outbreak of isoniazid-resistant TB (InR-TB), originally centred on a group of prisoners from HMP Pentonville, but which has since spread beyond, into other parts of the community. The outbreak is now in its 13th year and remains uncontrolled. It is argued that this illustrates the extent of misalignment between subsystems within the broader TB control system, and contra complexity theory, an inability of different system components (the prison healthcare system and the NHS) to co-adapt and learn in response to a crisis within the system. As with the mini case study in the previous chapter, attention is drawn to challenges arising from the organisational structure and function of London's TB control system.

The second case study in this chapter discusses the creation of the Health Protection Agency (HPA), and the hollowing-out of the DH. Unintended consequences arising from structural and organisational changes to the broader healthcare system required to

support the Agency's creation may well have been detrimental to TB control in London. This is ironic since the HPA's mandate involves controlling the spread of infectious diseases like TB.

The third case study in this chapter discusses two initiatives within London's TB control system which come from bottom-up, self-organising innovations: the Find & Treat Service (formerly the Find & Treat Team) and the Cohort Review process. This case study focuses largely on the genesis, challenges and metamorphoses of Find & Treat (F&T), but also compares and contrasts this initiative with Cohort Review. Despite the similarities between them, including their common goal of enhancing TB control in London, Cohort Review has been enthusiastically supported and promoted by the mainstream NHS, whilst F&T was the subject of deep suspicion and its operations were ultimately taken over by the NHS.

The chapter concludes with a discussion of the mid-range themes generated from the data, including those which arose inductively, and revisits the role played by the theory of professional dominance in this research.

Case Study Two: An Ongoing Outbreak of Drug Resistant TB in London: "a potential public health emergency, a time bomb"

As mentioned earlier, drug resistant TB is a serious and growing problem in London and is of particular interest as, organisationally, it represents a failure of the TB control system (Nathanson et al 2010). In the words of one key consultant, "If we did TB properly we wouldn't get these problems". When TB is properly treated and managed, drug resistant TB does not occur. In London, where both mono and MDRTB rates are climbing, this is further evidence of a system in trouble.

The InR-TB outbreak in London was first identified in January 2000, from samples collected in late 1999 in HMP Pentonville (Pentonville) and analysed by the Public Health Laboratory Service (PHLS) (Ruddy et al 2004). (The PHLS was a precursor to the Health Protection Agency.) In contrast to the sluggish organisational response to London's broader TB resurgence, there was a timely response to this outbreak, with an "Incident Control Committee", led by the PHLS, established within six months of the first cases being identified. In June 2001, the chair of the Committee issued her report,

including a sub-report focusing on the outbreak within Pentonville and the prison's role in the incident.

Prison Healthcare and TB in London

Of the original 58 cases analysed in the 2001 outbreak report, 15, or 26%, were connected to Pentonville. Eight or possibly nine of these cases acquired the disease whilst in prison. This transmission rate subsequently slowed, although by 2009, 23% of all InR-TB cases still had a prison connection. The HPA reports that new cases continue to occur in Pentonville and throughout the London prison system (Health Protection Agency 2012[d]), although the Agency no longer releases prison-specific numbers because of complications in collecting sufficiently accurate data on offenders, owing to the mobility of the prison population.

The Organisation of Prison Healthcare

Pentonville has been a central actor in the InR-TB outbreak, and its role, along with that of the broader prison healthcare system is discussed here. Understanding inter-organisational, or inter-agency, working amongst the bodies involved in prisoner health is important when analysing the role of Pentonville in this outbreak. This subsystem encapsulates, and often emulates, many of the problems plaguing the broader TB control system, such as fragmentation, and a lack of leadership and accountability. Components of this subsystem include:

1. the now defunct prison health system run by HM Prison Services and the Home Office, until 2006;
2. the replacement prison healthcare system, the Offender Health regime, administered by the NHS but with policy guidance coming from the Departments of Health and Justice;
3. HM Prison Services, the broader system of which prisoner healthcare services are a part; and,
4. prisoner escort services, outsourced since 1993 to various private firms (Williams et al 2000), with Serco holding the current contract until at least 2018.

The current NHS-led system of offender healthcare is a response to a 1999 report, *"The Future Organisation of Prison Health Care"*, produced jointly by HM Prison Service and the NHS Executive. This report was the result of unsparing criticism from the Chief Inspector of Prisons "who observed that the prison service patently fails to deliver a standard of health care equivalent to the NHS" (Grounds 2000:260). The report's focus was on the importance of "equivalency" between the levels of healthcare inside and

outside of prison, but it stopped short of recommending a full-scale assumption of prison healthcare by the NHS. Instead, it advocated a stronger collaboration between the NHS and HM Prison Service and for several years there were experiments with various forms of collaboration. After several years' experimentation in jointly managing and delivering prison healthcare, in 2006 the NHS assumed full responsibility for offender healthcare services. However,

> *over the past few years, there has been increasing concern about the quality, and continuity, of health care that the average offender receives both in and out of prison. Health care for offenders is not currently equivalent to the health care that everyone else in the country is receiving (Siva 2010:447).*

This observation, particularly with regard to continuity in healthcare, is reinforced by anecdotes from respondents. Several spoke of the difficulty in keeping TB-infected offenders on treatment once they are released from prison. Often, when a prisoner leaves prison in the morning for a court appearance it is not known whether he will be coming back to the prison later that day or released by the judge during his hearing. This presents a significant challenge for the system and, in the words of one respondent, is "a massive problem". Many prisoners have risk factors such as homelessness, drug and/or alcohol problems or mental illness, making it more likely they will not continue with their TB treatment post-release. This problem is exacerbated with remand prisoners whose chances of release are often highly unpredictable, meaning these prisoners lack a "release plan" (unlike offenders whose sentences are coming to a planned end and who are, in theory at least, instructed on how to continue their TB treatment). For remand prisoners, their release often comes without warning, so they may lack all knowledge about how to carry on with their treatment, including how to find a TB clinic which can supply their tablets. A nurse with prison healthcare experience recounted how she would try to ensure prisoners taking TB treatment would know what to do in the event they were released from court (but often without success):

> *Respondent : So that's very difficult to manage. And the only way you can do it is ensure the prisoner knows that if they walk from the court they must know where they've got to go. So I would say to them, "if you walk from the court, this is what you must do tomorrow", so that they've got a plan in place…So I would set something up for them and say "just suppose you get released, you must do this tomorrow".*
>
> *ST: And were most of them, would they follow-up as you discussed?*
>
> *Respondent : No*

This scenario also raises a general issue related to continuity of healthcare for prisoners, specifically handling and managing their medical records. Prisoners neither arrive at prison carrying their medical records nor once they leave prison do they take any new healthcare records back out into the community. Communication between the prison healthcare system and the community healthcare system remains spotty at best (Siva 2010).

The logistics of controlling the movement of the prison population, managed by HM Prison Service but delivered by the private contractor Serco, is also problematic. When a prisoner leaves the prison to attend a court hearing, documentation follows the prisoner, including medical records and any request for a return to the same prison. However, this system is far from foolproof and prisoners, including those with active TB, are sometimes taken to a different prison at the end of the court's working day. This usually happens because during the time they've been in court, their "home" prison has received a new influx of prisoners which brings the facility to its maximum capacity and the prisoners who left that morning are moved to other facilities. According to a well-informed respondent, it would not be unusual for the receiving prison's reception services to be so rushed that they would not properly check the prisoners' documentation upon arrival and a TB-infected prisoner would be checked-in, undetected, and treatment would cease. In the words of this respondent "too many times it (the system) hasn't worked".

This research uncovered three instances in which decisions taken by the prison healthcare system, post-NHS takeover, resulted in added challenges for the treatment of prisoners with TB, including InR-TB. These are outlined below.

First, an HPA evaluation on the utility of London's mobile x-ray unit (part of the F&T Team) acknowledged that Pentonville was playing a key role in the InR-TB outbreak and that prisons generally contained a high number of TB-infected inmates (208/100,000 versus approximately 44/100,000 in the general London population) (Story et al 2007). Consequently, it was decided to supply all London prisons with static X-ray machines. The objective was to screen all prisoners upon arrival for active TB (x-rays pick up only active pulmonary TB, but this is only this type of TB which is contagious). Plans to purchase the machines were made in 2005 (five-six years after the start of the InR-TB outbreak), but it was not until 2011 that the machines were in place in all five London prisons, i.e., 12 years after the initial outbreak. At the time of writing, the machines were not yet fully operational in most of the prisons, including in

Pentonville where, respondents say, the x-ray machine has still not been used to screen a single arriving prisoner for active pulmonary TB. Currently, the machines are rarely, if ever, used, and then only in acute situations such as for identifying swallowed foreign objects. A respondent familiar with the situation says the problem is a matter of resource allocation by prison healthcare staff. The prison health service refuses to fund the training necessary for staff to use the machines for TB screening, citing other priorities given shrinking budgets. One part of the NHS funded the machines, while another part of the NHS refuses to operationalise them for their intended purpose, demonstrating significant misalignment within the NHS. In the meantime, prisoners in London's over-crowded prison system remain unscreened for TB despite evidence that a prison history is a risk factor for TB (Story et al 2007).

The second problematic decision by prison healthcare officials concerns efforts at computerising prison health records. It was intended that computerisation would improve inter-prison communication, a significant issue as when prisoners are transferred between institutions their medical histories and records are often misplaced, as noted above. *Connecting for Health* is the NHS body responsible for building and maintaining the NHS IT infrastructure and for sourcing and installing e-records in the prison system. However, the first iteration of the system lacked the capacity to allow prisons to even share records amongst themselves. One research respondent told of how after the system was installed prison health staff would still have to print off the prisoners' health records and physically send them with the prisoner when they were transferred or sent to court with a pending possibility of transfer. When, some years later, *Connecting for Health* upgraded the system to allow for record sharing amongst HM prisons it did not purchase the "module" necessary to allow x-rays and x-ray reports to be sent electronically, and it is not possible for this capacity to be added to the system. Consequently, prison health staff must now convert x-rays to PDF format outside of the electronic record system and make a note in the prisoner's health record that such a report exists. Not surprisingly, requiring this additional effort from over-extended staff means x-rays and reports sometimes do not get added to prisoners' medical records. If the x-ray needs to be forwarded to another prison it must be done via email, raising privacy concerns. So in the rare event that the x-ray machines are actually used on a prisoner for their intended purpose - to assist in the diagnosis of TB – there is a risk that the resulting information may never find its way into the patient's medical record. Again, this is an instance of one part of the NHS (*Connecting for Health*) failing to align with another part of the NHS (prison healthcare).

The third problematic decision concerns the addition of "negative pressure" isolation facilities. The original 2001 HPA report into the InR-TB outbreak identified the issue of an absence of such facilities within HMP Pentonville as a problem requiring attention. However, it was not until after the NHS assumed responsibility for prison healthcare that facilities were built, indicating at least a five-year lag from when the problem was identified. Until the isolation rooms were built, prisoners with contagious TB were kept in single-bunked cells within the prison hospital, but the hatches in the cells through which food and medication were passed were open into the general prison hospital ward, and external ventilation was poor. When the NHS agreed to the construction of purpose-built isolation facilities the decision was seen as a clear step forward for TB control, particularly given the high transmissibility of the isoniazid-resistant strain within the prison. But as with the installation of the x-ray machines and the introduction of electronic medical records, issues arose when it came to executing the plan and again, one part of the NHS (prison health services) failed to communicate adequately with another (facilities management). The construction of the rooms/cells proceeded without consulting NHS infection control experts, of which the NHS had many. Consequently, the isolation cells were built without washing facilities, meaning that prisoners with contagious TB have to walk through the general prison hospital ward to exercise their statutory right to a daily bath or shower, sometimes doing so without wearing a face mask, according to a respondent. (This is still the current situation at Pentonville.)

Despite the challenges in the NHS' management of prison healthcare, Siva (2010) notes that the DH is pleased with the overall improvement in the standard of care and the partnership between the NHS and HM Prison Service, while noting there is room for improvement. The then director and head of offender health at the DH acknowledges the challenges and that more is needed "to even begin to address the array of complex, multiple needs evident in this population—requiring active partnership working across a range of health, criminal, and social care agencies" (Siva 2010:447).

Responding to the Outbreak in Pentonville

Starting with the early days of the outbreak, before the NHS was responsible for prison healthcare, the lack of a functional working relationship between the prison health system and the NHS caused problems. A senior TB nurse with significant experience liaising with the prison health system described how difficult it was to communicate with her prison counterparts. She described them as having very different methods of

working from nurses and other NHS clinicians , saying that the highly structured prison environment resulted in them being task focused (as opposed to patient focused), that they did not carry bleepers or use email, and that the only way to reach them was via telephone. This made it difficult to schedule prisoners' appointments at external TB clinics, or to organise visits to the prisons. These poor communications manifested in various outcomes, including difficulties in conducting contact tracing interviews and time delays in treating offenders infected with InR-TB after testing by prison healthcare staff and subsequent confirmation of the infection at external NHS or HPA laboratories. Delays in treatment meant more opportunities for this highly infectious strain of TB to spread within the overcrowded prison, or more opportunity for an infected offender to be transferred, released, or otherwise lost to follow-up and treatment. This troublesome state of affairs was described by a former senior public health leader:

> *…unlike anything else I've been involved with, you hear these ridiculous stories about, you know, a team would go into prisons and test. And I remember one horrible day they went to Pentonville and found five positive cases. But the prison escort system could only deal with one or two a week, so it would take us three weeks, minimum, to get all of those five people properly to a clinic to be assessed. And the clinic team were willing to go into Pentonville, but Pentonville didn't want them. And again, there was nobody to say "stop this, you know. These people, this is an emergency. They need their treatment sorted out within twenty-four hours. If they can't come to the clinic, the clinic will come to them and we will make that happen".*

As troubling as the obvious fragmentation and lack of leadership and communication between the prison healthcare system and the NHS was, the NHS response to it was equally disquieting. The respondent quoted above went on:

> *But you know, I sort of look back on it and think, you know, we should probably, should have been more assertive around stuff like that. But because the people in the frontline were just used to it, they would almost not bother to tell you the story, you know, because oh, "it's happened again". And so we were much too tolerant of people potentially spreading TB, I think.*

Besides being a further example of the fragmented nature of the TB control system, this anecdote illustrates how weak accountability and leadership can potentially translate into more TB cases. Perhaps if the nurses or even the person sharing the anecdote, a senior public health official, believed they would have to account for their actions, the response to Pentonville officials would have been more forceful and insistent.

Whilst the event recounted above happened at least six years ago, two research respondents indicated that this situation could occur again today. Both respondents suggested this is because prisoner health is still accorded a low priority by the prison

service, despite now being run by the NHS' offender health unit, and that in-reach by TB clinics to prisons, including Pentonville, remains weak. Communication and joint working between the TB clinics "on the outside" and the prisons is still often ineffective.

Why the InR-TB outbreak is cause for such concern

The outbreak is of particular concern for several reasons. First, isoniazid resistance "is one drug away from MDRTB" (senior TB consultant), which, as previously mentioned, is more lethal as well as complex and expensive to treat. Second, the strain of InR-TB circulating in London is highly transmissible, according to an HPA report, with an almost 100% higher transmission rate to contacts than the overall rate of TB transmission to contacts (21.5% vs. 11.3%) (Neely et al 2009). As early as 2004, an HPA report entitled "*Outbreak of Isoniazid Resistant Mycobacterium Tuberculosis in North London 1999-2004"* identified a case of community-acquired MDRTB, believed to have been contracted from an isoniazid-resistant patient who did not complete treatment and who went on to develop MDRTB. As seen in New York City's recent TB epidemic, community-acquired MDRTB infections cause great concern, and can lead to panic amongst the general public. Such infections embody the concept of TB "jumping the fence" from its usual epidemiological base of the poor and marginalised into middle class communities. This is also a concern for healthcare professionals in London's TB community, as the reality of rising MDRTB rates in London take hold:

> *What's going to happen if someone (middle class) contracts MDRTB and it turns out that all of us sitting here have been talking about it for years and knew it was going to happen? (Senior TB nurse speaking at a TB Clinical Working Group meeting, February 2010)*

Owing to the nature of the isoniazid-resistant outbreak's patient population, many of whom are described as having "chaotic lives", treatment completion rates were well below average, between 42%-68%, for the first 5 or so years of the outbreak, further increasing the risk of MDRTB transmission. Even by 2009, the completion rate stood at only 71%, well below the minimum target of 85% set by the Chief Medical Officer. (Of some concern, treatment completion data contained in the latest HPA report, for 2010, was available for only 106 of the 343 outbreak cases surveyed. But of those reported, treatment completion was 86%, a potentially significant improvement if sustained across the set of cases.) Finally, contact tracing in this outbreak is made more difficult because of reluctance by many InR-TB patients to share details about their personal lives. This further increases the risk that the disease will spread, undetected and untreated, outside its original patient base. Low treatment completion rates and

contact tracing are directly related to organisational functioning, and until addressed adequately within the outbreak population, it is unlikely the outbreak will be brought under control, especially given the high transmissibility of the strain.

Please refer to Appendix H for an overview of the InR-TB patient profile.

Treating InR-TB Patients

As discussed, widespread use of directly observed therapy (DOT) is regarded as an important component of successful TB control programs, but its use in London is limited and highly variable. In New York City, on the other hand, it is the default mode of treatment for all TB patients, regardless of their risk profile, and 76% of all patients, regardless of social risk profile, are on the regime (New York City Department of Health and Mental Hygiene 2009). DOT is seen as especially important for patients whose social risk factors which make it less likely they will successfully complete TB treatment; virtually all of London's InR-TB patient population fall into this category.

However, in keeping with the low overall DOT rates in London, only 52%, of InR-TB patients were on DOT in 2010. This is contrary to all official guidance provided by the WHO, NICE and the British Thoracic Society which indicates that DOT must be considered for *all* patients with one or more social risk factors. During the course of this research no adequate explanation for the low rates of DOT amongst InR-TB patients emerged, but it does provide further evidence of the ambivalence or reluctance toward establishing a serious DOT program in London. More than one respondent indicated that DOT, and enhanced case management in general, are not good uses of resources. The argument is that it is better to focus on the 80-85 per cent of patients who do not have a social risk factor rather than on the 15-20 per cent who do. This "80-20" split was raised by several interview subjects, none of whom had much professional contact with socially at-risk patients, but some of whom occupied senior or influential posts within the TB control system. In fact, a respondent heavily involved in developing the latest NICE guidance for treating "hard to reach" TB patients noted,

> *we tried to seek members to join the group and we didn't get one application to join from the London chest physicians, not one, which was pretty extraordinary.*

While targeting resources toward the larger group is a seemingly logical position, it ignores the distinct challenges presented by "the 20 per cent". A senior TB consultant described this group as:

> *the ones who cause all the problems, you know, they're the ones who don't turn up to treatment, they're the ones who have to get sectioned, they're the ones who are going to transmit infection locally. So they're kind of the ones that are indicative of poor control within this country... they're certainly going to be at least half of all the cases that are lost to follow-up.*

Given limited resources, it is tempting to focus the system's efforts on the "80 per cent", those patients who require little cost or effort to cure, placing the appropriate treatment of the 20 per cent of "high maintenance" patients who are difficult and often expensive to cure, as a lower priority. From this perspective it is easy to justify not providing the infrastructure to support DOT, not supporting the work of the Find & Treat team, and focusing on the purely clinical aspects of tuberculosis, at the cost of a broader public health perspective. More than once the argument was offered by interview subjects that that money spent on Find & Treat could hire at least 10 more nurses to work within established TB clinics. The merits and drawbacks of this strategy is an ongoing topic of discussion and debate within London TB control circles, with little agreement between the two camps.

The latest reports advocating changes to TB control in London, the *Model of Care* and the *Case for Change*, finally endorse the WHO, NICE and British Thoracic Society recommendations regarding DOT and at-risk patients. Although it appears that the documents are not moving forward within the NHS hierarchy, this may signal a new openness toward accepting the tenets of DOT and to perhaps promoting greater use of this approach. But the language, in keeping with that of previous reports, is weak and non-directive:

> *all patients should have a risk assessment for adherence to treatment, and DOT should be considered for patients who have social risk factors...The use of DOT improves treatment compliance and completion rates.* (NHS London 2011[a]:35)

Again, this stands in clear contrast with New York City's approach. As mentioned earlier, in that city DOT is mandated as the default approach for all newly diagnosed TB patients.

Treating the "20 percent", including the InR-TB patient population, and especially with regard to providing DOT and conducting effective contact tracing, tests London's TB control system and lays bare organisational shortcomings and challenges. In London, where the InR-TB outbreak has entered its second decade and MDRTB rates have more than doubled in the past four years, these challenges are clearly not being met. As with fully-drug sensitive TB in London, many reports document the epidemiology of the InR-TB outbreak, with some containing recommendations as to how the system should

respond. Typically recommendations focus on the need for more resources, but they also suggest ways to address operational issues, as discussed below. (These reports, it should be noted, are in addition to the 14 reports outlined in Chapter Six.) There is strong awareness of the seriousness of the situation, with the outbreak described in an undated presentation by NHS London, but circa 2003-2004, as a "potential public health emergency: 'a time bomb'". Almost a decade later the isoniazid resistant "time bomb" is still ticking, although usurped in urgency by the even more serious threat of rising rates of MDRTB.

A snapshot of the system's response to another rise in rates

Fully 13 years after the outbreak was first identified, it is continuing, uncontrolled, with cases now showing up across London. At a TB Clinical Working Group meeting in mid-2010 a troubling and surprising increase in isoniazid-resistant cases was revealed by the HPA. From an average of approximately five cases per quarter, 15 cases in the last quarter of 2009 were confirmed. A senior TB consultant, observed:

> *I said before the meeting, I said I want to know what's happened to the isoniazid resistant outbreak, and it was clear it had jumped 100 cases (since the last formal reporting). And where on earth, I mean, that was ridiculous. And what was most ridiculous about it was someone must have been looking at that data. They must have just been collecting the numbers and going oh, 'look at this curve, and it's gone up again. That's great. Let's see how it goes.'*

In the formally minuted words of a senior Director of Public Health, "the control mechanisms had been a complete failure".

After this finding, a sub-group was assembled to discuss the outbreak. The previous iterations of the Outbreak/Incident Control Committee had been subsumed by the TB Clinical Working Group and consequently, had stopped meeting (as revisited in the next section). It would be the first time in approximately 18 months that such a gathering had been organised, despite the HPA recommendation that a dedicated outbreak group convene at least every six months. During this period, the outbreak was continuing. Although it did appear for a time that the rate of new infections had stabilised, at no point was there evidence of a consistent decline.

The meeting was organised for a month hence, to be led again by the HPA and held at their offices, and was observed. Two key action items arose: (1) for the HPA to produce an updated spider diagram of the outbreak to enable the identification of "super spreaders" both within the prison system and in the wider community (it is unknown whether this ever happened as there were concerns expressed by the HPA about the resource intensiveness of the task), and (2) that a letter be sent to all case managers

(i.e., nurses) of recent outbreak cases asking them to ensure contact tracing for their outbreak cases was robust, "advising" them that all cases should be on DOT, and reminding them of the two acceptable pharmacological treatment regimes for these cases. An additional action item, related to undertaking a cohort review of these cases, was also agreed. (However, the need for this was superseded by the eventual adoption of the broader, formalised Cohort Review program across the city, as described in Case Study Four.)

At the start of the meeting the HPA stressed that the recommendations from their 2004 outbreak report, which built on those contained in their original 2001 report, were not reviewed and assessed as to the degree of follow-up or implementation which had occurred. This point was also highlighted in the formal meeting minutes, as discussed below. The overall impression left after observing this meeting was one of surprise at how timid and incremental the group's response was given the sharp rise in outbreak cases and the sense of urgency which had led to the meeting. The group's lack of authority was notable, as exemplified by the plan to send such a tentatively worded letter to case managers. But the organisational structure of the TB control system is such that the letter could take no other form. The nurses were employed by several different employers and this group had no authority to give them instruction – nor responsibility if their "advice" was not followed.

Organisational Restructuring and Inter-organisational Politics

Finally, any serious discussion of the InR-TB outbreak in London must acknowledge the potential impact of the creation of the HPA and ensuing inter-organisational politics between it and NHS London. Some of these inter-organisational challenges were carried over from the HPA's precursor, the Centre for Disease Surveillance and Control, Public Health Laboratory Service, and some of them were personality-based, but a disconnection, or misalignment, between the HPA's official mandate and its operational capacity appears to have exacerbated the situation. The next mini case study will discuss the genesis of the HPA and its impact on London's TB control system, highlighting the role of NPM principles in its formation. Consequently, the remainder of this section focuses on the inter-organisational dynamics between NHS London and the HPA.

During the course of conducting interviews, and in formal and informal "side" discussions, various NHS London personnel actively encouraged the pursuit of the story of London's InR-TB outbreak. It appeared that their motivation was to reveal the

outbreak story as what they saw as evidence of shortcomings by the HPA. The HPA, on the other hand, neither encouraged nor discouraged this line of inquiry.

Regarding their role in the outbreak, the HPA feel they were placed in an impossible situation. Whilst they were initially handed leadership of the isoniazid-resistant outbreak file, as they are for all TB outbreaks, treating and managing the individual outbreak cases is the responsibility of the NHS. In practice, this results in an organisational "disconnect" between the two key bodies responsible for addressing the outbreak. As part of its usual procedure during an outbreak, the HPA compiled important facts and data which, in this instance, they used to formulate recommendations on how the outbreak and its patients should be managed. But it is the job of NHS-run TB clinics to actually deliver the type of case management and patient care recommended by the HPA, as the HPA has no role in these areas. Neither does the HPA have the authority to compel the NHS to follow its recommendations as the HPA is, by statute, an arms-length advisory agency (for more detail, see below). In the words of a former commissioner in a London borough with a high rate of InR-TB cases:

> *...the rigidity is having surveillance and clinical practice, and the HPA and the NHS, and getting better coordination between the two. So there's this underlying problem of (isoniazid) resistance bubbling along...but it would seem to me that there's transmission occurring, which could probably be dealt with if there was better collaboration or coordination between the HPA, who kind of do the surveillance side of things, that say, "oh isn't that interesting" but in their defence don't really have the resources or the power or the expertise or the mandate, ultimately, to deal with that...and the TB Service*

A former senior DH advisor observed:

> *there was absolutely no strategy for doing anything about it, there was just a kind of, you know, "if we measure it enough it will go away and if we know enough about the people, if we know enough about their social networks and the bands they play in and the garages they work in...It will all be alright" and there wasn't, it's very interesting, it was almost like you were watching a forest fire and making lists of the trees that had been destroyed, instead of trying to find some water...it was a very bizarre situation.*

As will be argued in the next case study, this organisational disconnection is potentially significant and provides further evidence of the extensive, NPM-inspired fragmentation within the system.

As mentioned above, the first report with recommendations into the InR-TB outbreak was released in June 2001, by the HPA's predecessor, the Centre for Disease Surveillance and Control. Unbeknownst at the time, this would be the first of at least six

similar reports eventually produced, with the latest released in November, 2011. A précis of the recommendations contained in the HPA's initial report in 2001, along with their current status, follows:

Recommendation	Status
1. Local resources be put in place to ensure the outbreak is properly investigated and managed	not implemented
2. The temporary TB liaison nurse and other support posts be "funded as a priority" by local health agencies	not implemented
3. The instruction from the London Regional Office in 2000 "to ensure adequate resourcing for TB control is acted upon across the city"	not implemented
4. Following BTS guidelines (including the use of DOT for almost all I-RTB patients)	not implemented
5. Providing free anti-tuberculosis drugs	implemented several years later
6. Providing anti-tuberculosis drugs at the patient's clinic visit	implemented several years later
7. Providing food when patients attend for follow-up and covering the cost of travel to attend clinic, preferably up-front	generally not implemented, aside from in a few clinics
8. An understanding by clinics of "the importance of ensuring compliance and its monitoring as well as outcome monitoring" as outlined in letters sent to "chest physicians, Chief Executives of Trusts, Directors of Public Health and Consultants in Communicable Disease Control across London"	status not possible to assess but treatment completion rates amongst outbreak cases indicate it is unlikely that clinics responded
9. Urging "Local Authorities (to) prepare contingency plans for the likelihood that more of these cases will develop multi-drug resistant disease and be very difficult to manage for hospitals and the prison service"	not implemented

FIGURE 28: STATUS OF HPA RECOMMENDATIONS FOR RESPONDING TO THE INR-TB OUTBREAK

Although most of these recommendations were not implemented, in a follow-up report issued in 2004, a new set of recommendations is set forth by the Outbreak Control Committee under the leadership of the (now) HPA. These recommendations are more operationally focused and detailed and include:

1. Use a case management approach
2. Use DOT at the outset for patients at risk of non-adherence to treatment and for all outbreak patients unless the clinician deems it unnecessary
3. Provide support, outreach (including housing and help with benefits) and incentives

4. (Interestingly) no change to current recommendations for contact tracing (although this changed shortly thereafter to suggest aggressive contact tracing)
5. Semi-annual meetings of the Outbreak Control Committee

The 2004 report outlines these recommendations in tabular form over 13 pages, including columns for "Action" and most notably, "Responsibility". A sample page from this report is reproduced in Appendix J. Those identified as responsible for implementing various key actions are largely external to the HPA and beyond the organisation's realm of control. Again, the fragmentation within the system is evident.

With the tabling of this report leadership of the Outbreak Control Committee changed from the (now) HPA to NHS London. The number and seniority of representation from the NHS on the control committee increased at the same time. The change in leadership (though not the membership) was ultimately short-lived, lasting only two or three years, but at the time of its occurrence it was seen as a coup by NHS London and a firm rebuke of the HPA's handling of the outbreak. Archived electronic files accessed for this research contain a 2004 document entitled "Isoniazid Resistant TB Incident Control Committee: Review of Terms of Reference (TOR) and membership" which contains the arguments from the NHS in support of the changes. They focus on the need for "additional expert and cross-London input" (i.e., expertise which goes beyond epidemiology and with a more localised, borough-level focus) and the need to respond to

> *extensive organisational changes in the NHS, with the formation of Primary Care Trusts (PCTs) and Strategic Health Authorities (SHAs) in 2002 and the Health Protection Agency in 2003…the ICC's (Incident Control Committee) roles, executive responsibilities and accountability are unclear within these new organisations.*

The document further states:

- *The new membership of the ICC should take into account the balance between:*
  - *The expert advisory role of the ICC* (i.e, the HPA's role) *and direct management/executive responsibility for the incident* (i.e, the NHS' role)
  - *Central co-ordination and communication vs. responsibility within individual sectors*

Despite these NHS-led changes, there was no ensuing reversal in InR-TB rates, and the new committee's recommendations, issued in 2006, were almost identical to those proposed in the 2004 report. But the change did manage to generate tensions between the HPA and the NHS London, some of which remain today. In the words of a senior HPA official:

Respondent: Because there were some dynamics around the isoniazid resistant outbreak actually as well, in terms of whether the HPA was the right body, exemplified by (name redacted) and whether that was the right ownership, because at that stage it had grown to a certain size and I think the sense was...

ST: The outbreak had or the...?

R: The outbreak had and I think there was a sense that, there is a stage when this needs to be owned politically by the NHS, by Directors of Public Health. I have a feeling that that's what happened...but they (the NHS) created a group that couldn't do what its terms of reference were. (They) created a group that subsumed the activity of the pre-existing isoniazid resistant TB outbreak team... But the agenda would be, we were there for like a whole day, you could never get through all the business that needed to be done because some groups were not working effectively, in fact they were disbanded. So that was too ambitious, so for me, I found that fascinating.

Nonetheless, a senior NHS official who played a key role in orchestrating the change remains convinced that it was a necessary move, that the HPA was simply not up to the task of leading the outbreak committee:

The isoniazid resistant response should have been grasped and managed much earlier on. The response was far too little, far too late...that's where the Health Protection Agency bit did or did not come in...it retained a surveillance focus rather than a control focus and they were the one organisation that could possibly have brought everybody together and dealt with the control, rather than the, "oh, look it's rising again"...it isn't as if things didn't happen, they did, but nevertheless, they were insufficient, insufficiently coordinated

As will be highlighted in Case Study Four, the NHS London staged another similar "coup", or takeover, when it brought the Find & Treat team under its purview and control. On one level, these takeovers might be seen as efforts at reducing fragmentation, but it will be argued later that a deeply rooted instinct within the NHS toward strong control and risk management is a more likely primary motivation. In the case of the outbreak committee, once the NHS controlled the group, it effectively shut it down by rolling it into the broader TB Clinical Working Group. A similar scenario is unfolding with the Find & Treat Service, which may also be headed for extinction.

Whatever validity the NHS criticisms of the HPA may have, the HPA-led reports contained detailed recommendations for action by both themselves and the NHS, and the majority of the NHS-focused recommendations were never implemented. The reasons for this are complex: fragmentation in the system; ongoing NHS restructuring; lack of authority and leadership to drive the necessary changes; and, an absence of responsibility and accountability for why these changes never occurred. However, the fact that these recommendations were never formally reviewed for follow-up remains a point of contention with senior HPA officials:

> *Now the review that was agreed the last time round is... more description...and again we've been tasked with it. So it's less about the system and how the system has responded to those cases and what it means... but still the automatic reaction, "oh get a review, get a group together to agree what the review will be". Whereas, in fact, arguably what the review should have been, is of those (early) wide-reaching recommendations, many of which talked about the systems, not just about the cases, clearly. And have they been enacted or done? So it's an interesting one, yes.* (Senior HPA respondent and leader on the InR-TB outbreak)

The source of this rivalry, or tension, between the HPA and the NHS was never articulated during this research. Some of it is certainly personality driven, but it also likely relates to attempts by both parties to assign blame or responsibility to the other for inability to manage the outbreak. The HPA assumed leadership of the issue when the outbreak was first identified as this is standard operating procedure in the case of TB outbreaks, most of which occur at schools, colleges/universities or workplaces. These "incidents" generally have defined boundaries and last for relatively short periods of time - as long as it takes to identify and test all of the initial case's contacts, and then turn diagnosed cases over to TB clinics for treatment. And since the vast majority of TB patients do not fit into the "chaotic lifestyle" category of the typical InR-TB patient, they complete a basic course of TB treatment and are cured, usually within 6 months. As the InR-TB outbreak has been going on for 13 years, there have been abundant opportunities for disagreement, tensions and accusations to arise, as indeed appears to be the case.

Summary of Case Study Two

This vignette has discussed the ongoing InR-TB outbreak in London, using it as a microcosm to illustrate organisational challenges and shortcomings within London's broader TB control system. It discussed the nature of the outbreak, highlighting the challenging life circumstances of many of the InR-TB patients, the difficulties in ensuring their successful treatment and cure, and the importance of so doing in order to minimise their risk of developing MDRTB and subsequently spreading it. It was noted that many of the outbreak patients have prison histories, with HMP Pentonville playing a key role. This role, along with that of the prison healthcare system more generally, was also discussed. As with the previous case study, comparing New York City and London, the issue of NPM-inspired fragmentation within the system arose. Within HMP Pentonville, there were recurring instances of misalignment amongst components of this subsystem and an apparent inability of components to learn from, or communicate with, each other. These operational shortcomings had a significant

impact, for example, in the construction of inadequate isolation facilities in the prison hospital.

In complexity theory terms, this scenario stands in stark contrast to what would be expected from a complex system, where actors and components within systems are expected to co-evolve and adapt to changing realities. Similarly, there was no apparent self-organisation amongst system actors, or emergent innovation. Non-linearity is arguably evident in terms of the lack of positive results despite significant prison healthcare infrastructure investments (x-ray machines, isolation facilities, e-healthcare records), although all of them were poorly executed or operationalised. Consistent with complexity theory, the system's history does seem significant in explaining its current status, particularly regarding the prison service. After years of poor levels of care and infection control for TB-infected prisoners, the system's long overdue attempts at improvement have met with limited success and middling levels of commitment from officials.

The case study also discussed the role of the HPA in managing the outbreak, with particular emphasis on the sometimes difficult relationship between it and NHS London. The HPA is an arms-length government advisory body. NHS London is, among many other things, an operational and service delivery organisation over which the HPA has no authority. Similarly, the NHS does not have any authority over the HPA. This typically NPM-based structural and organisational configuration makes accountabilities unclear, invites opportunities for misalignment, and embodies the fragmentation which characterises the broader TB control system as well as that of the outbreak subsystem. It is argued here that these factors have been detrimental in controlling, let alone ending, the InR-TB outbreak.

Finally, a lack of accountability within the system emerged as an important organisational issue. Also highlighted was the NHS' apparent instinct to take over independent subsystems or organisations which, in their view, require greater control and more rigorous risk management, reflecting an NPM-induced desire toward excessive risk management and control.

The HPA will now be discussed at more length. The next vignette highlights the agency's genesis and what its formation has meant for the DH. It also revisits the concept, introduced earlier in this chapter, of how the Agency's organisational structure, roles and objectives within the broader healthcare system has likely affected TB control in London.

Case Study Three: Creating the Health Protection Agency, the Subsequent Hollowing Out Of the Department of Health and the Potential Impact on TB Control in London

The Role of the Health Protection Agency

The Health Protection Agency was created in 2003, initially by an Order of Parliament, followed in 2004 by an Act of Parliament. The HPA is an executive, non-departmental public body whose enacting legislation describes its role as follows:

> *(1) The Agency has the following functions in relation to health—*
>
> *(a) the protection of the community (or any part of the community) against infectious disease and other dangers to health;*
>
> *(b) the prevention of the spread of infectious disease;*
>
> *(c) the provision of assistance to any other person who exercises functions in relation to the matters mentioned in paragraphs (a) and (b).* (Health Protection Agency Act 2004)

The establishment of the HPA is in keeping with what had become a well established public policy orientation toward NPM principles. In this instance, a once powerful line department, Health, was disaggregated and structurally flattened as a consequence of, and possibly as part of the motivation for, creating the HPA. As will be discussed in more length later, this move resulted in a loss of policy and functional expertise within the DH, or in a "hollowing out", in NPM parlance. Most in-house public health experts at the Department were relocated to the new HPA as a spun-out agency and became employees of that organisation, joining other public health experts from the former Public Health Laboratory Service (also once closely aligned to Health), along with a variety of other professionals.

The HPA regards itself as an independent, arms-length agency whose objective is

> *to protect the public from threats to their health from infectious diseases and environment hazards. It does this by providing advice and information to the general public, to health professionals such as doctors and nurses, and to national and local government.* (Health Protection Agency 2010:3)

The term "*providing advice and information"* is key to understanding the HPA's role and its inherent limitations in TB control. The Agency has limited operational functionality in the healthcare system aside from providing expert and specialised

laboratory services and sophisticated disease surveillance data. But with regard to TB at least, this limitation has not prevented the HPA from adopting goals and assuming responsibilities which extend well beyond acting in an advisory capacity. It is argued here that this has resulted in a misunderstanding within the HPA itself, and the broader TB control system, regarding the Agency's role and responsibilities within the TB control system.

When it was established, the Agency adopted 12 strategic goals to guide its work, as detailed in Appendix K. Of these, three are directly relevant to TB control:

- *To reduce the incidence and consequences of infection*
- *To strengthen information and communication systems for identifying and tracking diseases and exposures to infectious, chemical and radiological hazards*
- *To build and improve the evidence base through a comprehensive programme of research*

With specific regard to tuberculosis, the Agency states that its mandate is "to reduce the incidence and consequences of tuberculosis" and to "work towards preventing tuberculosis transmission by identifying and managing tuberculosis clusters." (Health Protection Agency 2011[c]:18-19).

Of interest is the action-oriented language of these goals, which indicate a role for the HPA beyond that of acting in an advisory capacity. Of those goals listed above, the Agency has the clear capacity to implement improvements to IT systems and to conduct research. And indeed it has done so with regard to TB. However, it is not at all obvious how the HPA could "reduce the incidence and consequences of tuberculosis" (or most infections, for that matter), and "work(ing) towards preventing tuberculosis transmission by…managing tuberculosis clusters" also presents organisational and functional challenges (although the HPA does routinely *identify* TB clusters, owing to its microbiological expertise). Structural and legal constraints within the HPA mean executing these goals is challenging, perhaps unrealistic. The Agency has limited operational capacity when it comes to communicable disease control, as healthcare delivery in the UK is the purview of the NHS (and private providers). An example was discussed in Case Study Two, with the HPA offering concrete recommendations for managing the InR-TB outbreak whilst the NHS largely failed to implement them. Even with regard to managing and coordinating TB outbreaks, for which the HPA is responsible, they still rely on, variously:

- *the NHS to supply the nurses to conduct onsite screening,*

- *the local PCT to agree to pay for rapid testing if this is deemed preferable or necessary by the HPA, and,*
- *TB clinics, usually within acute trusts, to supply and administer the lengthy course of TB treatment.*

In sum, it is not clear how the HPA can be expected to fulfil the mandate "to reduce the incidence and consequences of tuberculosis" in the absence of the necessary operational capacity. It is similarly unclear as to why the Agency assumed such responsibility at the time of its creation when its founders may have known it lacked the capacity needed. When queried on this point, a senior HPA official involved in the formation of the Agency, and who also has high level oversight responsibilities for TB control, dismissed the importance of the organisational objectives:

> *I think that those organisational documents, you see them in so many other areas too, are aspirational and naïve. And naïve in the kind of way that organisational documents often are…particularly in health there's, you know, "we should not be about process. We should be about outcome"…but actually the one cog in the clock, no matter how perfect it is, no matter how well-oiled it is, it is but one cog in the clock and it cannot alone, deliver these things, unless the other parts of the clock do the same thing, pull in the same direction. So the notion that the HPA's activity in this area should be judged on the basis of that kind of outcome for TB seems to me to be absurd.*

Whilst not entirely clear from these comments, there was sense this may have been the first time the respondent had considered the issue of the mismatch between the Agency's goals with relation to TB and its capacity to deliver on them:

> *…but the kind of targets set should fit the remit of the organization. And so if the HPA…was given overall responsibility for TB services in this country, including every aspect of it, right from new entrants' screening to delivery of treatment…then, and I think only then would it be appropriate to have the kind of targets that are being set…*
>
> *There may be an argument for saying the HPA's role in TB control…should not be defined as it currently is, but should be extended to take on a greater proportion of the whole job. If that were the case, then those targets, objectives, whatever, could then sensibly be broadened to take that into account. But short of that, it doesn't make a great deal of sense to be measuring the HPA in those terms.*

These observations indicate that misalignment within the TB control system had become normalised so that it was no longer apparent to some of those involved in it, even those who had contributed to its creation.

But for others, including some HPA staff and those delivering TB care and control, there was an awareness of the misalignment between the HPA's mandate and its operational capacity. Specifically, respondents wondered whether the HPA is responsible for the

control of TB as well as its surveillance, and the extent to which the organisation could function beyond a purely advisory capacity:

> *But then…we were kind of created as a separate body… so the delivery of the whole thing is with the NHS. We are in an advisory capacity. It (TB control)…should be led by the NHS. Because we don't have the resources…They hold the resources…and they know it's not within the HPA to be able to achieve that (reduction in TB rates). The achievement is going to have to come from the NHS because they have all the money. So there's no point in having a goal for our organisation when the delivery is within the NHS because we'll fail. Who is responsible? We don't know…We have not got any muscle at all.* (HPA consultant)

> *…they* (HPA)*just sit in their Ivory Tower. And it's not out of unwillingness, I think, that they don't participate or want to do a really good job but, I think in one sense, they themselves might just feel powerless to do things. Because, you know, I'm being quite damning here, but I think there's a lot of…really good people…that… seem to have taken a step back in engagement…* (PCT manager)

> *So the HPA can monitor what the problem is, and think they ought to do something about it, but they can't. It's got no levers to pull.* (Chief Executive)

> *…the Health Protection Agency, which I guess was both for me, and…I am going to talk honestly, it was both a problem as well as a solution. (I)t meant …(y)ou could get data from it in a way that had been much harder …previously, but then they had no interest really, in health service data. They just wanted to map. So actually, they were very much about describing and analysing, but not very much about "so what does this mean in terms of action?".*(Former Director of Public Health)

> *I would go to meetings that would last four hours, I'm not exaggerating, at which we would have presentation after presentation… about cluster analyses, how it was spreading, the rates, how it was mutating, all these sort of wonderful overheads…And I'm sitting thinking, nobody ever mentions doing anything to stop it and it was almost as if, well, "it's not our job", you know, it wasn't something they did.* (Former senior DH employee)

Similarly, a Chief Executive interviewed for this research indicated that the lack of clarity regarding the HPA's role, or the recurring sense that the Agency's potential effectiveness has not been maximised, can be traced to the HPA's origins:

> *when the HPA was created, there was no discussion with Chief Executives about what would we like, what were we losing, how would it work. It was designed by the public health people and that's it. So I have no idea what to expect from the HPA.* (NHS Chief Executive)

The Creation of the Health Protection Agency

At the time of the HPA's creation its first Chairman, Sir William Stewart, described the Agency as "a global first, with an unflinching commitment to ever-improving health

protection for the public whom we serve" (Health Protection Agency, 2004[b]). A rather less glorious description comes from a former Director of Public Health interviewed for this research: "(the) Health Protection Agency was assembled out of bits of things that were in the Department" (of Health). These "bits" included the Public Health Laboratory Service, with its Centre for Disease Surveillance and Control and specialised microbiology services, in addition to in-house departmental experts working in communicable diseases, infection control and other public health related areas.

Several respondents indicated their belief that the motivation for creating the HPA arose from the 9/11 tragedy in New York City and that the initiative was largely driven by the then Chief Medical Officer. There was a sense that the UK was increasingly vulnerable to radiological, chemical and biological terrorism and that government required an expert, arms-length body to advise them on how to prepare and respond. From this, the idea grew to include more traditional health protection functions, including communicable and infectious disease control. Some respondents also likened the HPA to the American Centre for Disease Control in its broad, national mandate. Regardless of the external or political motivations, its creation was predictable within the context of a public policy agenda guided by New Public Management principles.

As mentioned above, at the time of its formation, the HPA subsumed the former PHLS, including the Centre for Disease Surveillance and Control and the Microbiology Reference Lab. Whilst they were officially arms-length, operating under their own legislation, the *Public Health Laboratory Service Act*, these bodies were widely viewed by interview respondents as being part of the DH. The role of the PHLS was "to provide a national framework for surveillance and control of infection and update and inform effective public health policies" (Cranshaw et al 2000:132). The authors go on to note that the "service receives core funding from the Department of Health" (p.132), or in the more colourful language of another former Director of Public Health, the DH were "the paymasters" of the PHLS.

This history is important in understanding the current relationship between the HPA and the DH as it illustrates the traditional link, and the history of control, which has existed between the Department and the broader public health function in the UK. Notably, expertise in the area of communicable diseases, however, resided mainly within Local Authorities, and for a short while during the creation of the HPA, within PCTs. But with the creation of the HPA, these communicable disease experts from the

Local Authorities moved into this new organisation, resulting in a melange of expertise coming from a variety of organisations and employers.

(Unintended) Consequences of the Creation of the Health Protection Agency

Consultants in Communicable Disease Control (CCDCs) were tasked with managing, advising and coordinating issues related to public health, including TB. (This is the same group discussed previously, in relation to the important role they played in focusing attention on rising TB rates in the early 1990s.)The CCDCs were formally employed by the NHS, but were physically located within Local Authority offices, working as part of larger public health teams and reporting to the local Director of Public Health. Whilst this is further evidence of the fragmentation which has long characterised London's TB control system, the arrangement is reported to have worked well by those respondents who were part of it and they clearly felt themselves to be members of local authority teams. Additionally, the CCDCs had some budget holding power within the local authority and possessed a sense of power and influence in terms of setting public health and spending priorities. In the words of a long-serving CCDC:

> *I used to have a budget in my health authority…for hands-on work…the health authority budget was available if we wanted to embark on any program, we had direct access to that through the Director of Public Health.*

With the creation of the HPA, CCDCs were removed from local authorities and became employees of the newly created HPA, working within geographically aligned "Health Protection Units". With this move they lost much of their influence and were no longer budget-holders, able to direct investment in local TB control initiatives. Their new relationship with local authorities, now PCTs, had become advisory:

> *Respondent: …we (the HPA) haven't got any money to tell you (the PCT), to give you, to do this. And the PCT says "we've got our own priorities. You may advise us endlessly, but (laughs) we've got our own priorities"*
>
> *ST: And does that happen?*
>
> *Respondent: Yes, oh yes. Even up to now... in (name redacted) Trust, we don't have the right number of TB nurses. We are in an endless struggle with the PCTs…* (Long-serving CCDC)

And in the words of a PCT manager:

> *When they (the CCDCs) were in the PCT, yes, they had their own budgets. They had, you know, generally a very good and direct link to the Boards, to the Directors…"I'm the CCDC. This is my responsibility locally. This is what you need to do", in the old system. Now, it's "I'm a CCDC. This is my responsibility, this is my advice." Um, and then the responsibility goes back to the Director of Public Health (in the PCT) to implement that or not...And I think, in a sense,*

that's a great shame because I think CCDCs have got a lot to offer and I don't think they're utilized.

A senior HPA employee conceded longstanding concerns regarding the former CCDCs acting solely in "advising" roles rather than both advising and "doing", as had been the case:

> *…and indeed it's one of the key concerns I had many years ago when they were creating the HPUs, because many of the Consultants in Clinical Disease Control are very clear, that they didn't want to take on some of the "doing" responsibilities…that their role stopped at advising. And I felt that that wasn't really the right approach, that they felt the "doing" wasn't their job…Yes, when the HPUs were created that very quickly became the norm and accepted as the approach. But in many instances it was the same individuals working within health authorities that did both the advising and the "doing", and then they suddenly got jobs that allowed them to do just the advising and not the "doing", which from a personal point of view you can see the attraction actually, you do less.*

The issue of the physical location of the CCDCs, post-HPA creation, emerged as a recurring theme during interviews. A number of respondents indicated that TB was better represented and had a higher profile when the CCDCs were physically co-located with Directors of Public Health and were in the organisations where TB program and service delivery decisions were made, namely, the local authorities:

> *One of the changes that I noted over that time period…is I felt much closer to TB when the Communicable Disease Consultant was…was reporting to me…when the CCDC moved to the Health Protection Agency, it was firstly one stage removed and then we stopped getting any feedback from the Health Protection Agency. The lead (TB) person ceased to be my CCDC. It was somebody else in the sector… and then it just, it just all felt too distant. I never got, you know, the London-wide feedback as to what was going on.* (Former Director of Public Health)

> *What I saw was a disengagement with the local area. When the CCDCs went into the HPU, they went from a local hub to a sector hub, physically, and as a result, I felt in the (name redacted) sector, the engagement from the CCDCs with the PCTs was simply a lot less because they were physically somewhere else and there wasn't this kind of day to day interaction…And you normally have to have a fairly good reason not to take (the) advice of the HPA but, you know, it's just their advice. It's nothing more than that. We can discard as we like*…(PCT Manager)

Since the HPA's role is largely limited to advising (aside from provision of microbiology services), it is logical that the Agency's burden of accountability would be impacted. This issue of accountability was raised during the consultation process held prior to the Agency's formation. The broad public health community, including the Faculty of Public Health and the Royal Institute of Public Health, voiced concern regarding the nature of accountability within the new organisation (Pickles 2004). Responsibility for

communicable disease control formally rests with local authorities, and even with the establishment of the HPA, there "was no intention to undermine the responsibilities of local authorities" (Pickles 2004:241). Various DH guidance documents "have served to emphasise the key responsibilities of NHS bodies such as acute trusts (and) Primary Care Trusts, confirming the HPA in an advisory role" (Pickles 2004:242). The HPA lacks formal accountability for its involvement in TB control, which is arguably consistent with its purely advisory capacity. But in reality, this absence of accountability spreads well beyond the HPA, to include the NHS and the DH, even though these bodies do have statutory accountabilities.

Relationship Between the HPA and the DH

As noted earlier, there has been a lengthy historical relationship between the public health function and the DH. Although the Department lost considerable public health policy expertise with the creation of the HPA, they stopped well short of removing themselves completely from the public health arena. As can be seen in the below excerpt from the HPA's Management Statement, the administrative relationship between the DH and the HPA is close, with Health retaining significant influence on the operations of the HPA – a typically NPM "steering not rowing" relationship.

> *The Department of Health determines the Health Protection Agency's performance framework in the light of the Department's wider strategic aims the Health Protection Agency shall submit annually to the Department a draft of the Agency's updated corporate plan covering five years ahead.*
>
> *The Health Protection Agency shall have agreed with the Department the issues to be addressed in the plan and the timetable for its preparation.*
>
> *The main elements of the plan – including the key performance targets – shall be agreed between the Department and the Health Protection Agency in the light of the Department's decisions on policy and resources taken in the context of the Government's wider public expenditure plans and decisions.*
>
> (Health Protection Agency 2005)

The relationship between the DH and the HPA was summarised succinctly by a senior TB consultant, "...while officially arm's length, it's a very short arm, isn't it?"

During the course of this research the sometimes complicated dynamic between the HPA and the DH was discussed by research participants.

> *Now the relationship with the HPA is very, very strange... And I don't think it's worked terribly well...But as they've lost power (the DH), they've become more and more paranoid about losing even more power and I'll give you a really good example of this. When I was doing consultancy for (them)...one day...there was a meeting set up between (a senior DH official) and TB Alert...And I can't*

remember who it was…who said, "why are they developing all these leaflets when we've got some really good ones done by the HPA?" And one of us…was foolish enough to download them from the internet and print them off…Well, (the senior DH official) happened to walk past and absolutely hit the roof. "How dare they, how dare they produce these leaflets without my permission?" I thought, my goodness, there's one very scared person and somebody who can see their department flying out of the window. Because after all, if you have no responsibility for, if you like, governance of the NHS, infectious disease services, and you don't have a public health role because that's been taken over by NHS London, and for monitoring you knew it was being done by the HPA, but now they're taking the health promotion role away from you, which was the last little crumb of power you had left. (The senior DH official) was incandescent with rage and wanted to ring the Chief Exec of the HPA. And we were all looking at one another with our eyes rolling, I mean crazy …But that shows you the level of fear and there's no trust, no trust at all. (Former DH and NHS manager)

Another respondent cast doubt on the extent to which the HPA operates at arm's length from the DH:

I've been at press (conferences) when the latest figures have come out about tuberculosis from the Health Protection Agency, where the HPA spin doctors have been there, looking at how it's being presented. And the HPA is meant to be an arms-length body, it's not meant to be influenced by DH. Just ask the HPA whether that's true. That's why the HPA gets people in from the outside, like me, to talk at their conferences, because I can say things which HPA employees are told not to say…(P)eople who work in…the HPA, unless they are really convinced that it's off the record, are going to find it difficult to say just how much the dead hand of the Department of Health is…I mean, I was asked to speak by the HPA when the figures came out about 4 years ago….do a commentary on the figures. And that was because no one at the HPA, understandably, wanted to say, "look, they've gone up. This is bad news." The figures showed it had gone up by 11%. I then got a message from a junior person at the DH who said "I have just been shouted at, saying 'who was that guy (name redacted) talking at the HPA, stirring up the mud?'. And I said, 'tell me who it was?' And I then rang up the CMO's office and said 'you have an amateur Alistair Campbell working in your office.' (Senior TB Consultant)

Impact of the Creation of the Health Protection Agency on the Department of Health

The Department lost personnel, and expertise, when the HPA was formed, but this was part of an ongoing trend. A former Department employee recalled how, at one time, the Department was home to well regarded Advisory Groups on various issues, including communicable diseases, but that these groups were eventually disbanded during rounds of restructuring. And at least one key TB expert was not replaced after leaving in 2007 and another in early 2010. At the time of writing, there was only one junior official remaining in the Department whose job was solely dedicated to TB. She is

supported by two others – her manager and her manager's manager – both of whom have much broader infectious diseases mandates. None of these individuals focus on London, but rather have national remits.

Whilst they were invited to the TB Commissioning Board meetings, it was rare for a DH representative to attend, and a review of meeting minutes shows the Department was represented at less than one-third of these meetings. Observations, field notes and formal meeting minutes reveal that for those meetings at which there was Departmental attendance, the representative would play a minor role, generally contributing only when asked for input. These observations validate the view of a former Department employee who said that by 2009, the DH was effectively "out of the TB business", save for responding to Ministerial queries and drafting correspondence.

The DH was the least supportive key stakeholder of this research presenting challenges with arranging interviews, reversing decisions on access to meetings, and generally not providing thorough answers to questions when access was granted.

A surprising example of the sense of powerlessness regarding TB control apparently felt by DH officials – whether justified or not –was observed at a March 2010 national meeting of TB stakeholders. This was the only Department-led meeting for which approval to observe was granted for this research. There were approximately 30 participants from across England, including two representatives from the London TB Commissioning Board, and various other NHS representatives. The Find & Treat team and the HPA were also present. In summary comments at the end of the meeting, the most senior DH official with direct responsibility for TB offered the following observation: "We have to figure out how to most effectively influence the NHS to make them understand how important TB is." This comment belies a startling sense of disempowerment coming from the organisation whose mandate involves "responsibility for standards of health care, including the NHS… and…set(ting) the direction on promoting and protecting the public's health, taking the lead on issues such as…infectious diseases." (Department of Health 2012).

It would also likely surprise many of those interviewed for this research, especially those within the NHS. Several research participants shared their belief that the DH was more powerful than it knew, or acknowledged:

> *The Department of Health are a case in point of people who have so much power they don't even know it. They…could tell the NHS what to do and the NHS would do it. The Department of Health will say to you "we're just here to*

> *advise". I say, "Then advise. Advise that they do this." They don't get it. From an NHS point of view, if I get something which has Department of Health written all over it, we jump.* (Senior NHS TB Consultant)

In the words of a former employee of the Department: "the Department of Health has got a big hat, even if it doesn't have a big stick".

And an anecdote taken from research field notes underscores how the NHS perceives the Department as wielding considerable power over TB control, even if the Department itself is ambivalent about its role. Upon learning that NHS London's Acting Director of Public Health (DPH) was to meet with representatives of the TB Commissioning Board (an infrequent event), the Department, "summonsed", in the words of one of the Commissioning Board representatives, the Acting DPH to their offices just hours before the meeting with the Commissioning Board representatives was to take place. According to the Acting DPH the purpose was to make sure the Department's latest activities in TB control in London were known. Although the Acting DPH was more senior than the person at Health "requesting" the meeting, there was apparently never any consideration given to not complying with the request to meet, although it did generate considerable consternation on the part of the Acting DPH.

Nonetheless, the over-riding sense among research respondents was that the DH's *involvement* in TB control, as opposed to any *power* it might have, was not significant:

> *… the Department of Health were no part of my thinking managing TB…in terms of delivery, they were no part of my thinking. We weren't doing TB because of the Department of Health.* (Former Sector Chief Executive with involvement in TB)

> *And I mean that meeting we went to…the All-Party Parliamentary Group, I mean, that was really obvious…the fact that, you know, there is no interest in the Department of Health to do anything.* (Senior TB Consultant)

> *I've sort of noticed them by their absence really actually, I suppose… because I can't remember, I'm trying to remember seeing someone. I mean they do occasionally turn up at the meetings.* (Senior TB Consultant)

Amongst those involved with TB control in London there appears to be (well justified) confusion regarding the respective roles and responsibilities of the NHS, the DH and the HPA. The DH believes, or acts, as if it has little power or ability to affect change in TB control, although it has formal management responsibilities and apparently, significant influence, over the HPA. The Department is also officially tasked with providing strategic leadership for the NHS. The HPA, as discussed, has limited operational capacity, whilst labouring under an official mandate which includes the "control" of TB. The NHS, whilst not disavowing its responsibility for TB control, does not prioritise the

issue and, on occasion, has attempted to offload some of this responsibility, most notably to the HPA (despite the Agency's lack of operational ability). Meanwhile, the DH neither encourages nor advises the NHS to make TB control a higher priority, although it could do so.

A chief cause, it is argued here, is a marked absence of leadership on the TB control issue. Whether or not it is correct to lay the responsibility for this at the door of the DH is unclear, but this was the perception of a key respondent, and the most senior person interviewed for this research from the HPA: "I think a failure on the Department to take...that strong, strategic leadership contributes to the limited effectiveness of TB control in this country".

If the DH does indeed have the power to force action on TB control in London and to make it a higher priority, there is almost no political motivation to do so, as will be discussed in more detail in Chapter Eight. The lack of leadership and the absence of accountability within the system are two sides of the same coin, as a functional accountability structure would necessarily result in an identifiable leadership structure. And at the root of both problems is the extensive NPM-induced fragmentation of London's TB control system. As discussed in Chapter Four, a relentless drive toward localism has pushed decision making down to the extent that no one is any longer responsible for anything beyond small patient populations, a damaging situation for TB and public health more generally. In addition, a weak contracting regime and an absence of performance measurement within London's TB control system further exacerbate the situation.

Summary of Case Study Three

This case study has analysed the creation of the Health Protection Agency, including the impact this has had on the DH and the potentially negative implications for TB control in London. In keeping with NPM principles, the HPA was formed largely via a disaggregation of the DH, leading to a downsizing of the Department's policy core and a gradual, but significantly reduced, level of engagement by the Department with TB control. In addition to deriving expertise from the DH, the HPA drew other key personnel, Consultants in Communicable Disease Control, from local authorities. This, too, had important, and negative, implications for TB control because these CCDCs lost the budgetary and decision making power they had had in the local authorities, assuming purely advisory roles in the new Agency. The current role of the DH was also examined, questioning whether it might possess latent power which it could exercise to

improve the organisation of TB control in London, particularly with regard to addressing the inter-related issues of a paucity of leadership and accountability within the system. Enhanced leadership and accountability structures could go some distance toward offsetting many of the negative consequences arising from the NPM-driven fragmentation which has come to define TB control in London.

Unlike the other mini case studies in this thesis, this one provides less evidence of complexity theory concepts and focuses on illustrating the presence and impact of NPM organising principles on London's TB control system. Complexity is notable largely by its absence. The introduction of the HPA to the TB control system could be seen as adding diversity to the system, which, according to complexity theory can be a positive change, making a system more robust. In this case, however, there were no benefits realised.

The next case study highlights two innovations brought to London's TB control system, framing them as contrasting instances of self-organisation. Whilst London's system of TB control stands to benefit from both initiatives, one of them, the cohort review process, has been embraced by the mainstream NHS and the other, the Find & Treat team, faced considerable challenges and was eventually taken over by the NHS.

Case Study Four: Two Self-Organising Initiatives, Two Very Different Organisational Outcomes

Homelessness, substance abuse and a history of imprisonment are significant risk factors for TB (Story et al 2007). Typically, a TB patient with one or more of these risk factors presents at hospital A&Es, often several times, before being correctly diagnosed with TB. It is often then a challenge to find the person again to deliver the TB diagnosis, whilst subsequently keeping him or her on a difficult and often side effect-laden medication regime for six or more months can be almost impossible. Therefore, the challenge in addressing this particular population of TB patients lies both in *finding* and then successfully *treating* them.

In contrast to the reticence shown in some circles toward adopting learnings from New York City's successful approach to TB control, there was a greater openness towards exploring successful models from abroad for working with so-called "hard to reach" TB patients. In particular, Rotterdam, Netherlands had demonstrated notable success with its TB control program aimed at at-risk populations. A chance encounter in 2002 at a

conference between a senior and highly enterprising London TB nurse and a TB consultant from Rotterdam set the wheels in motion for the establishment in London of a mobile x-ray unit (MXU, also known as "the Van") and, approximately two years later, an associated team of health and social care experts working in and with the Van.

This team, the "Find & Treat" team (F&T), has a clear objective: finding and treating active TB cases amongst socially marginalised groups and re-engaging TB patients which traditional TB clinics had "lost" part-way through the treatment cycle, ensuring these individuals complete their TB treatment. The creation of F&T exemplifies two complexity theory concepts: non-linearity and self–organisation. Non-linearity is evident in that one serendipitous encounter between two strangers resulted in a complete transformation in the manner in which socially excluded TB patients in London are now diagnosed and then treated for their disease. And unlike a previously cited example of non-linearity, where vast sums of money were spent on installing x-ray units in prisons with minimal benefit to TB control, F&T represents a positive instance of non-linearity. Self-organisation is demonstrated throughout the emergence and subsequent execution of the F&T concept, details of which will be discussed below.

Once back in London, the above-noted nurse actively pursued the idea of having an MXU in London. He was well-connected within the DH, and although the Department rarely funds operational projects, it was his first stop. Rather fortuitously, he encountered a pair of equally enterprising, and newly arrived, civil servants who enthusiastically supported his idea and were willing to work across boundaries and interpret accepted Departmental practice to support the MXU concept. Through a series of unorthodox actions, one of Rotterdam's MXUs was soon on the streets of London for a short trial run. One of the key people involved in bringing this MXU to London recalls the episode:

> *So we did this crazy thing, which looking back on it I still can't believe we did it. We brought the van over for three days. And it was madness really. Again, I can't believe we did it and we got into all kinds of trouble. We got caught from a guy called (name redacted) at the medical devices agency, and he said, "I think you're just about to make a huge career mistake because you're breaking all kinds of laws" and we just didn't know. We were so naïve… And we had, you know, people would suddenly say, "oh we need to get the doctor who's coming (from Rotterdam) a special dispensation and a permit, we need to get him employed…by the University College Hospital". And then we realized that the van was radioactive and we had to get special permissions from Customs and Excise. But we did it.*
>
> *And we got it to Pentonville and we (also) x-rayed loads of homeless people and we discovered that homeless people were willing to be x-rayed. And they*

recruited…their very first outreach worker, who was a homeless guy with a bicycle, an ex-soldier. It seemed it would work, you know, it was worth a try.[18]

This short pilot project generated a great deal of enthusiasm and commitment amongst those involved. However, both of the above-noted civil servants, without whose support the pilot project would likely never have been realised, had short-lived tenures at the Department. One was transferred to a newly formed agency and the other's contract was not renewed.

With this change in personnel it became more difficult to find the necessary financial support to convert the pilot project into something more permanent. Nonetheless, the MXU concept had generated enough interest by that time, and produced enough believers in its value, that, exceptionally, the DH funded the purchase and operation of a bespoke mobile x-ray unit to be used amongst London's most at-risk populations. By April 2005 the Van was fully operational, although it would be almost two years later that the Find & Treat team was formally assembled and funded (again, exceptionally, by the DH) with the objective of ensuring that those TB patients who were found by the Van were also successfully treated to completion.

The Van itself is sophisticated and efficient. It delivers a significantly lower dose of radiation than is the case with traditional, static x-ray units. It takes less than 0.1 second to make an exposure, as opposed to the five second exposure required with traditional machines. This is important because it is often difficult to keep F&T clients still for the standard five seconds required to take an x-ray. In the words of one F& T member, their client base is often "referred to as 'highly mobile', (and) they are 'highly mobile'!" The resulting imagery is of diagnostic quality and is usually produced in less than one minute. This is vital as it allows the client to be quickly given either an "all-clear" or "held on to if they are not" (F&T team member), and then taken, literally, to a nearby TB clinic for follow-up. This rapid turnaround requires another area of special expertise - the ability to read x-rays accurately yet very quickly. The MXU team learned from their Dutch mentors that such skill is usually only found amongst radiographers accustomed to screening at a population level. Armed with this knowledge, they were fortunate to recruit a former Port Health Screening Unit radiographer with 30 years' experience reading chest x-rays.

[18] In fact, during the Dutch MXU's short time in London three contagious TB patients were found amongst 600 people screened. In the words of one of the people working on the MXU at that time, none of these men would have otherwise been diagnosed "in a month of Sundays". As is often the case with marginalised populations, all three had been avoiding traditional health services, despite their failing health.

The F&T team is multi-disciplinary, comprising nurses, caseworkers, radiographers, operations and clerical staff, numbering approximately ten to 12 in total. Some of the earlier staff, in particular, were former or seconded DH, NHS and HPA employees. From their early days as a team they adopted unorthodox methods of working and service delivery, as suggested by their patient base and the sometimes tricky maintenance required by the Van. They worked odd hours. The Van would arrive at hostels early in the morning so they could intercept occupants as they were being made to check out for the day. Outreach workers from the Team would turn up at known congregating spots for rough sleepers, sex workers and drug users late at night in order to administer DOT. They employed creative techniques, like using Skype to watch a TB patient with a complex twice-daily treatment regime take his tablets. This initiative saved the patient from almost six hours of daily commuting to TB clinics to avail himself of DOT, since there were no outreach workers available to administer DOT, recognising that the patient was unlikely to complete such a complex treatment regime if left on his own.

The Team invests extensive effort in collecting social network information from and about their clients. "We work on the assumption that we need to plan for *when* they get lost, not *if* they get lost...so we can find them again", remarked an F&T worker. Relevant information is entered into a database so it can be accessed across the Team. In the case of lost MDRTB clients, the Team also tap into police, probation service and homeless services' databases, too, if necessary, having established working relationships with all of these groups. In essence, the Team go to exceptional lengths to locate patients and then ensure they complete their treatment. They also have highly developed expertise in working with, and at the fringes of, the social care and housing systems and often assist clients in accessing services such as accommodation and substance abuse treatment.

The MXU and the Find & Treat team have been extensively and repeatedly evaluated. The first evaluation commissioned by the DH covered years one and two of the Van's operation. The preliminary report concluded that the Van was a cost-effective intervention in terms of finding people on the streets who needed TB treatment but that it was not enough just to find them, that they had to be treated, too. In fact, 53% of all potential TB patients identified in the MXU and referred for further investigation would never present themselves to a TB clinic for a definitive diagnosis. Consequently, before the evaluation was completed, the team which would become known as "Find & Treat" was formally put into action, in large part to address this situation. From this

point onward, evaluations would assess the work of both the Van and F&T, and in common parlance "Find & Treat" would soon come to refer to the complete service offered by both the Van and the Team.

The latest evaluation report of F&T's work was completed in April 2011, by the HPA. As with previous evaluations, it reached a positive conclusion regarding F&T's value. In a section entitled "Evidence of value for money", the report states:

> *The incremental cost-effectiveness of F&T is estimated to be £8800, well below the threshold of £20,000 - £30,000 per QALY gained used by the NICE to determine if an intervention is cost effective…both the MXU and the case management arms (the Find and Treat team on its own) appear to be separately cost-effective. These conclusions appear to be robust when assumptions that are more unfavourable to F&T are used…The cost effectiveness of the F&T service compares favourably to other interventions currently funded to control TB in the UK. The incremental cost effectiveness ratio for the dual strategy of tuberculin skin testing and Interferon Gamma Release Assay testing is £29,955 per QALY gained and for universal BCG vaccination of school aged children is £56,000 per QALY gained.*

But F&T's existence was a perilous one. They never secured stable, long-term funding and they gradually became marginalised, particularly from NHS London. Once the DH ended its financial support of F&T in early 2011, and in the absence of a central TB budget for London, the Team became reliant on each London PCT contributing to fund its work. As discussed earlier, the epidemiological pattern of TB across London, largely a reflection of the socio-economic demographic across the city, is such that it is difficult to convince a borough with single-digit TB rates and low levels of homelessness to contribute some of its shrinking healthcare funding to finance something for which it has little need. Although the Team made a point of visiting every borough in London at least once each year, the reality is that demand is highest for their expertise in a handful of boroughs, mostly where there are many people with no fixed abode, rough sleepers and illegal drugs users. In terms of the "80 per cent" versus the "20 per cent" debate discussed earlier, F&Ts client base lies firmly within the latter group, and perhaps comprises the most marginalised subgroup of the already marginal "20 per cent".

The culture that had developed within F&T was one of treating "people not pathogens" (F&T worker), meaning that clients' overall health and wellbeing is attended to, and requires working across boundaries. In addition to working with housing and social care, the Team also proactively developed working relationships with other external organisations in order to address the health needs of the whole person, not just the

part of the person which needed TB treatment. For example, working relationships were established to address dental hygiene and foot care issues, both common problems for homeless people. The Team would give toothpaste to clients whom they had just x-rayed, or direct them to dentists whose offices would be amenable to treating them.

The Team also developed strong working relationships with hostel staff across London so that when the Van was coming, hostels would organise to offer general health "MOTs" to their clients.

> *So rather than just gear up for the Van, they bring in all those other allied services and they're finding that it results in an increase in uptake of BBV (blood borne virus) screening, STI screening, flu vaccine, uptakes in general health assessment. And perhaps most importantly, results in an uptake of a kind of collective will for onward referrals to address their Hep C, etc. (*Find & Treat Nurse)

Perhaps more importantly, though, these same hostel workers, along with other social care workers, were recruited by F&T in the Team's mission to expand DOT across London – "our mantra is DOT", in the words of an F&T leader. Much of the London hostels' client base need this therapy, but are unable to access the program, or to access it with sufficient ease that they would stay on the program:

> *And I think that one of the big achievements is that we've been able to recruit in a lot more capacity to offer DOT in the community by engaging with the hostel key workers, the drug and alcohol teams, the street teams. It's in their interest to promote treatment continuity and it's in our interest to promote treatment continuity. And I think therein lies a big part of the learning from this project…it's partnership working, it's all about linking things together.* (Find & Treat Nurse)

However, in a perverse instance of reward and punishment, the Team may have been ultimately penalised for such boundary-spanning innovations and for moving beyond a strict TB focus. In late 2010, when the TB Commissioning Board was deciding whether they would champion F&Ts work and attempt to secure funding for them from London's PCTs, one of the informal (i.e., unwritten) arguments presented against supporting the Team was that they were not exclusively focused on TB and spent time on non-TB related work. Some within the TB Commissioning Board argued that F&T should look to other areas of the NHS and to social care funders for financial support. This argument reflects the reality in which TB control is administered in London: a system where "joined-up" working is rare and where there is no systemic capacity or infrastructure to support it. It also begs further comparison with New York City's

model, where a "homeless services" directorate is incorporated into the Bureau of TB Control, along with services dedicated to social outreach, HIV coordination and immigration and refugee services. From a complexity theory perspective, it is interesting to note the positive impact on F&T when they added new and different elements to their team (social care, housing, dental care and foot care). By increasing its "requisite variety", the Team offered a better service to its client base, as would be predicted by complexity theory. It is therefore ironic that this effort to become more holistic may have also have contributed to the team's ultimate undoing. Interestingly, this situation echoes the previously discussed inability of NHS London to deal with the concept of the London TB Commissioning Board becoming a more holistic TB Control Board.

The NHS had further issues with Find & Treat, beyond its proclivity for boundary spanning and unorthodox service delivery. The Team was, in fact, part of a social enterprise, structured as a Community Interest Company, with governance structures and practices that were unclear and foreign to the NHS. As they sat apart from mainstream healthcare services, they "looked" and worked differently. One research respondent reported "resentment" amongst some visitors to F&T's unconventional London Soho offices. Despite having "woodworm and...smell(ing) damp", this respondent observed:

> *But there's no doubt that people going for meetings there see that they have a dishwasher and coffee on tap and flowers. And I mean I don't know who pays for the flowers, maybe (name redacted) pays for the flowers, maybe they have a kitty, but people don't see it. People just think, they have coffee and biscuits, they have flowers and a dishwasher, why am I working in, I don't know, Kings College Hospital in Dulwich or Peckham or somewhere.*

Neither positive, independent evaluations and reports on F&T's work, nor an advisory panel comprised of senior TB clinicians, researchers and epidemiologists, provided solace to NHS London. It was displeased with the seemingly risky and uncontrolled manner in which F&T functioned. They were seen as a child of the DH; NHS London did not trust them and undertook to bring the Team under mainstream NHS control.

Anatomy of a "Takeover"

This resolve, combined with cutbacks at the DH and the announced dissolution of the HPA (both organisations had significant pockets of support for F&T), meant that once the Team's DH funding expired on 31 March, 2011 they would effectively cease to exist in their original form. The first formal mention by the TB Commissioning Board

regarding the need to address the impending end of F&T came during a regular monthly Board meeting on 22 October 2010. It was revealed that NHS London representatives on the Board had met with the DH in September to discuss future funding options for F&T. The meeting also addressed the HPA's (positive) draft, interim evaluation of the Team. The DH had made it clear that they were unable to continue funding F&T and that, as per the original terms of the pilot project, if London boroughs decided the Team was of value, they would have to find a way to pay for it.

An apparent additional outcome of the TB Commissioning Board-DH meeting was that the TB Commissioning Board representatives (NHS managers) concluded that the HPA draft evaluation, clearly heading towards recommending on-going funding for F&T, was vulnerable to critique. Shortly thereafter, NHS London hired an external consultant, a TB expert who had previously undertaken a cost-effectiveness evaluation of Moscow's MXU service and concluded it did not offer good value for money. His mandate was to critique the HPA interim report, including finding methodological and other weaknesses which might call into question the Agency's conclusions. This work was undertaken quietly and without the knowledge of the full TB Commissioning Board, of which the HPA is a member, although they eventually became aware of the undertaking. The external consultant's report indeed found methodological fault with the HPA's work (although all of these issues were addressed in the final version of the report), but concluded that it was not possible with the information provided to determine whether or not F&T and the MXU were cost effective.

This decision to commission an external critique of the HPA's work was seen by the HPA as an aggressive act and caused considerable upset within the Agency. But according to one respondent, perhaps the over-riding reaction at the HPA was one of bewilderment, wondering why the NHS would go to such lengths. Parallels might be drawn here with NHS London's response to the HPA's leadership of the InR-TB outbreak committee. In both instances the HPA was either taking a position different from that favoured by the NHS (concluding that F&T was cost-effective and should be continued) or exerting control greater than that with which the NHS was comfortable (the HPA leadership of the InR-TB outbreak committee). In both cases the NHS intervened decisively; either regaining control of the situation or shifting the general "direction of travel" to one which they favoured.

On December 17th 2010 there was a special TB Commissioning Board meeting called to discuss the future of Find & Treat. During this meeting there were five papers discussed:

1. A joint DH/Find & Treat document, *"DH Find and Treat: Options Paper for the London TB Commissioning Board*". Conclusion: "the preferred DH option was the continued funding of F&T and the MXU service"
2. The HPA interim report, "*The cost-effectiveness of the Find and Treat Service*", the one which had been reviewed by the external consultant. Conclusion: The HPA reiterated the interim nature of their findings (because they were initially given a 30 April 2011 deadline by the DH), but observed - based on highly conservative assumptions – that "while the MXU was considered to be cost-effective, the F&T was more so".
3. The external consultant's "*Assessment of the HPA preliminary report on the evaluation of the Find and Treat service*". Conclusion: as noted above: "insufficient evidence...to make a final decision about the service"
4. The HPA response to the external reviewer's comments. Conclusion: noted the external consultant's previous views on MXU cost-effectiveness from the Moscow study and argued that "he may be biased against this type of service". Defended itself against the methodological issues raised, arguing that "conclusions could not be drawn…based on the data available at the time."
5. NHS "*Find and Treat Business Plan*". Conclusion: The first point was a caveat that "costs in the Business Plan were based on data provided by the F&T Team. This data should be audited…including consideration of source documentation." Recommendation was to discontinue funding the MXU and "establish a small pan-London link team and integrating F&T principles within the sectors"

In addition to being notable because its conclusions differed significantly from those drawn by the DH, the HPA and the external consultant, the NHS document is remarkable in two other aspects. First, it laid bare the mistrust which had come to characterise the NHS' perception of the DH, the HPA and Find & Treat, regarding their assessments on the value of F&T. Second, and perhaps more surprisingly, its recommended course of action was to add to already significant fragmentation and duplication within London's TB services by suggesting that each of the five geographic sectors have, in effect, their own mini F&T teams, supplemented by the above-noted "small pan-London link team". This recommendation was produced by the NHS at the same time as the Commissioning Board, led by the NHS, was embracing the PHAST

report conclusions regarding the need to reduce the widespread fragmentation within London's TB services. Such was the apparent antagonism toward F&T by the NHS' Commissioning Support for London (later to become part of London Health Programs) that they were willing to further fragment TB control services in their aim of disbanding the Team.

Nonetheless, at the December 17th 2010 meeting it was decided, on the weight of evidence, and after vigorous lobbying by a few members of the House of Lords, that the Board would approach PCTs to secure funding for Find & Treat for one more year, until 31 March 2012. This decision was a minor rebuke of the NHS' Commissioning Support for London business plan, but meant the landscape would change fundamentally for F&T if the PCTs agreed to the funding request. Under the terms of the proposed new funding there were no resources earmarked for the MXU, Find & Treat would provide their services under strictly defined contractual terms working within an acute trust, the size of the Team would be reduced by approximately 30% and their operating budget would be cut by approximately 25%.

The TB Commissioning Board succeeded in securing F&T funding from the PCTs for one year. The practical outcome, however, is that the once maverick group working out of edgy offices in Soho now find themselves, in reduced numbers, working in severely cramped quarters in an obscure corner of an NHS Trust, providing clearly defined and delineated services within a conventional NHS commissioning contract. Their future beyond April 2013 is unknown, and during the intervening period of 1 April 2011 to 31 March 2013 a decision will be reached regarding the longer term future of F&T, including finding resources to purchase a much-needed replacement van.

That the TB Commissioning Board succeeded in securing funding for F&T quickly and with relative ease, reflects two facts:

1. Find & Treat, led by a highly committed and persuasive leader, had been tirelessly working with the hundreds of organisations with which it had developed relationships over the years, along with numerous politicians in the Commons and the House of Lords, to apply strategic and ongoing pressure within the broader NHS in favour of continuing F&T's funding.
2. A growing body of scientific evidence, some of it peer reviewed and published, supported the Team's work. Further, the PHAST report found extremely high satisfaction levels amongst users of the service, including every TB clinic in London.

This combination led to significant political pressure on the NHS to ensure that F&T's work continued and they were politically savvy enough to realise that they should acquiesce to this pressure. A senior TB Commissioning Board member observed at the April 2011 Board meeting, "It's unavoidable now. We will be funding Find and Treat. That's the political reality."

In August 2011, the same Board member reiterated this fact: "Politically I can't argue for killing Find & Treat. And the reality is that the £800,000 cost (F&T's annual budget) will not be re-invested in TB, it will go to someone else's bottom line."

However, field notes and meeting minutes reveal a strong sense within NHS London, and elements of the TB Commissioning Board, that F&T must change those behaviours deemed unacceptable by the mainstream NHS: "They are now part of the mainstream NHS and they need to behave as such", remarked a senior TB Commissioning Board member. And, rather peculiarly in light of the robust cost effectiveness and other data which had been amassed, a March 4th 2011 memo from the TB Commissioning Board entitled "Find and Treat Update" stated: "*The SLA* (service level agreement) *for service delivery is currently being drafted and will include key changes to current provision (sic) to ensure the team are cost effective, productive and maximise outcomes."*

During early 2011, whenever "Find & Treat" would appear as an agenda item on Commissioning Board or TB Clinical Working Group meetings, meetings were often tense. This was especially true of Clinical Working Group meetings, with their broad representation of NHS, HPA and occasionally, DH, officials. During one particularly memorable and strained meeting on 31 March 2011, on the eve of F&T's absorption into the NHS, the HPA, along with Find & Treat's newly appointed clinical director, made their unhappiness with the NHS' handling of the Find & Treat file clear. The HPA led the pre-organised charge, by demanding that more than the five minutes which had been allocated to discuss F&T be made available. They argued that they were being asked to, de facto, validate changes to the F&T model which they were given inadequate time to consider and which required lengthier deliberation. They expressed concerns that F&T was being significantly reconfigured for the upcoming year despite every evaluation to date being positive; that, in effect, the NHS was attempting to fix something which was not broken, and for reasons which were never clearly outlined. NHS officials at the meeting attempted to diffuse the tension in the room, but with no success.

The new Clinical Director for F&T (whose appointment was agreed by the NHS and F&T) made several strongly worded interventions clearly meant to show he would protect the Team's interests. He said it was his "prerogative" to decide, operationally, how the F&T service was delivered, announcing, "I will not be taking advice from people who plan, but from people who do".[19] His apparent passion for F&T resulted in some (ultimately short-lived) concern amongst NHS representatives on the TB Commissioning Board. A leader of the Commissioning Board noted shortly afterwards, at the April Board meeting, that "the current enthusiasm for F&T (emanating from this individual) must be managed". This, in turn, prompted one of the TB consultants on the Commissioning Board to ask why the latest positive evaluation of F&T was being seen as a "bad thing". "Shouldn't we be celebrating this?", he asked.

Months later, in August, 2011, field notes from a Commissioning Board meeting indicate that the NHS was still struggling to accept F&T's value to the broader TB control system. A senior and influential NHS manager said that while the HPA may have demonstrated F&T's cost-effectiveness, the Team did not provide "value for money". Presumably this was a reference to the manager's belief that the money spent on F&T, i.e., on treating "the 20%", would be better invested on "the 80%". And later still, at the December 2011 TB Commissioning Board meeting, the need for a "contractual requirement" specifying that F&T work within the "TB care pathway", (as defined by the NHS), and the need for the Team to contribute to "improving the efficiency and effectiveness of the overall TB system", was raised. This need to have F&T's operations fit into an NHS-defined mould, thereby ignoring the nature of F&Ts work and its client base, is an example of the NHS' determination to control and closely risk-manage the Team.

Find & Treat, post-takeover

The Find & Treat *Team* was officially rebadged the Find & Treat *Service*, apparently in an effort to underscore the end of their existence as a stand-alone entity and to signal their integration into the NHS. The HPA's evaluation of the cost effectiveness of F&T, the quality of which had been called into question by the NHS, went on to be published in the British Medical Journal (Jitt et al 2011).

[19] While this intervention may have sent an early warning shot across the NHS bow, the Clinical Director's influence (and enthusiasm) was ultimately quelled by the commissioning contract and structure under which F&T now provide their services.

Despite their interest in managing F&T via contract, according to respondents within F&T, the NHS' commissioning contract did not arrive until 6 months into fiscal year 2011-12 (this assertion is consistent with field notes and observations). The document was said to be 162 pages long and, apparently, deemed so complex by F&T that it was never read, owing both to a lack of resources and inclination. Further, the performance reports which were required by the contract, according to F&T sources, asked for extensive, often irrelevant data, or data which F&T were unable to provide. In response, F&T offered alternative templates for the reports, versions which they believed collected more useful and germane data. The NHS declined the offer and continues to send F&T its version of the report template, whilst F&T continues to only partly complete the template. Consequently, reports indicate that F&T's activity level is down, although F&T vigorously dispute this, claiming that if the same pre-takeover activities were being counted, activity levels would be the same or slightly higher.

During the monthly Commissioning Board meeting in August 2011, the "Find and Treat Update" focused on how the NHS was returning the incomplete performance reports to F&T with requests that F&T complete the form in the format which they received it, rather than persisting in adding information which the NHS had not requested. The argument was that the NHS required the template's proper completion in order to properly "performance manage", i.e., control, F&T. Clearly this tussle for control is not one which either the NHS/TB Commissioning Board or F&T are willing to concede. In one of the last meetings observed as part of this research, in February 2012, a senior leader on the Commissioning Board complained that F&T "just go around things" and don't tell commissioners what they are doing. "We just need a bit more compliance", it was observed, as "they don't behave like they are part of the NHS". During a follow-up interview with F&T in August 2012 it became clear that the struggle between the Team and the NHS regarding the activity reports persists. The Team see themselves as victims of a "hostile takeover" and this lessens their sense of obligation to accommodate NHS requests with which they do not agree.

On a more positive note, some previously reticent members of the TB Commissioning Board, and the NHS, have ultimately been convinced of F&T's value, albeit begrudgingly. A senior member of the Commissioning Board conceded he had "been persuaded of the value of Find & Treat, but now we'll have to focus on improving their performance management". As noted, the Board consequently and successfully sought another year's worth of funding from PCTs for the team, this time until March 31st, 2013. At the time of writing, Find & Treat's future remains unknown beyond this date.

One respondent expressed concern about the long-term future of F&T even before the Team was taken over by the NHS:

> *You see…if you made it part of the big NHS system, the "management" in the bad sense of the word would start chipping away at it. They would kill it and eventually it would be shut down because they would need the money for something else. I've seen that happen in loads of areas. (Former DH and PCT employee)*

As has been the case since the dissolution of the original F&T team, they do not receive communications from the TB Commissioning Board or from London Health Programs regarding future funding: "The turkeys have taken over, and the turkeys may decide that this year there will be no Christmas", said a clearly exasperated F&T team member. The result is a highly insecure and uncertain work environment, but informants within F&T said this has led them to seek alternative sources of funding from other government departments and large third-sector organisations. The Team has an aspirational goal of becoming independent of NHS funding – and control.

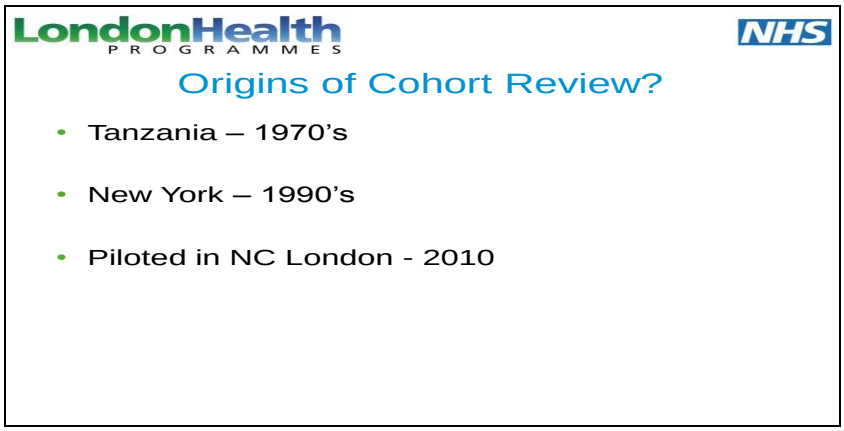
The Cohort Review Process

In sharp contrast to the experience of F&T, the establishment and subsequent acceptance of the cohort review process ("cohort review") by the NHS has been both smooth and enthusiastic. In 2009, five TB nurses from London visited New York City to see that city's TB control system at work. (Notably, perhaps, the nurses' visit was not funded by the NHS, but rather by the Royal College of Nursing, with some assistance from the HPA.) Feedback from this study visit was highly positive, and there was great enthusiasm regarding the potential benefits of implementing some of the practices in London which had been so successful in New York City. Key among these practices was "cohort review", a highly systematised case review procedure that had been used with great success from the early days of TB's resurgence in New York City in the early 1990s. The process is particularly successful in increasing treatment completion rates and contact tracing (Munsiff et al 2006), and is invariably cited by TB officials from that city as vital to their success. In effect, it is a tool which enhances clinic-level accountability. By having clinics report their data in a meeting of peers from other clinics, transparency is increased and, if necessary, questions asked about lagging treatment completion rates or inadequate contact tracing. Such meetings usually happen on a quarterly basis.

The cohort review concept originated in Tanzania in the 1970s, but it was not until the re-emergence of TB in the West in the late 20th century that it was embraced outside of the developing world. In the 40-odd years of its existence, the benefits of cohort review

became well known in TB circles and documented in the medical press (Veen et al 1998, Munsiff et al 2006, Arnadottir 2009). It is seen as a fundamental complement to a successful DOT program (Cegielski et al 2006:20) and, in the words of a respondent, cohort review "shines a bright light" on the manner in which both individual clinics and the broader TB control system functions, revealing any shortcomings and problems.

Despite its success and acceptance in many countries around the world, cohort review was, curiously, not so much as piloted in London until 2010. By this time, TB rates in London had been climbing steadily for more than 20 years. While this time lag may seem surprising, London TB officials did not shy away from acknowledging it. At the 2012 World TB Day conference held in London, the following slide was presented, with London TB officials seemingly unbothered that it spoke volumes about how slowly the city's TB control system has been to adopt learnings from other jurisdictions.



Source: NHS London (2012)

The pilot project referenced above involved the North Central London TB sector, the home sector for one of the five nurses who had travelled to New York City and the person who would become, perhaps, London's most enthusiastic and tireless proponent for the program. (Two of the other nurses who travelled to New York City were from Find & Treat, and interestingly, Find & Treat were responsible for securing the travel grant for this study trip. The fourth nurse was from the HPA and the fifth nurse worked within the NHS but left shortly after the trip.)

Within the London TB control system, the North Central London sector is arguably the furthest advanced in terms of addressing issues of duplication and fragmentation in TB service delivery. For instance, several years ago the sector decided to merge its various TB nursing and (limited) outreach services, spread across five boroughs, into a single TB service with a single nurse manager. Because of this relatively innovative working

arrangement, the sector was well suited to pilot the cohort review process.[20] Within a year of the trip to New York City, cohort review was set to be piloted in London.

As part of this research two of the early cohort review meetings were observed. The process is highly labour and resource-intensive, and each meeting lasted almost a full day, as each case from each clinic in attendance was presented. Epidemiologists from the HPA compiled, in real time, the data as it was presented, allowing them to feed back preliminary findings at the mid-point of the day and then final findings at the end of the day. Participants presenting the case data were mostly nurses from TB clinics across the sector, sometimes supported by TB consultants from their clinics. The nurses were highly engaged, although clearly nervous at the beginning of the meetings. The nurse leading the meetings was the same person who had originally travelled to New York City and was championing the process, and she took great care to reassure participants that they were in a "safe" environment. She repeatedly stressed that the objective was not to penalise or judge clinics, but rather to start the process of collecting detailed clinic-level data, identifying trends, and determining what was working well and where there was room for improvement. It would be fair to judge the meetings as rousing successes. Participants reported feelings of excitement about the cohort review process and were committed to addressing the areas for improvement identified by the HPA. Post-meeting conversation indicated they were already looking forward to the next quarterly meeting to see whether their clinic had improved and to observe how their peers had responded to the process, too.

Despite its late arrival, cohort review has been enthusiastically embraced in London. From the above-noted pilot, the program has now spread to all sectors in London and from 2012 it was added to London's "Commissioning Intentions" for TB, imparting a contractual obligation for providers to undertake at least some version of cohort review (if indeed they follow the Commissioning Intentions). Field notes and formal meeting minutes indicate that there was virtually no debate or opposition to this move during meetings. In contrast to when "Find and Treat" appeared as an agenda item at meetings and would be often met with sighs of resignation or frustration (at TB Commissioning Board meetings), or by rising tension (at Clinical Working Group meetings), a "Cohort Review" discussion engendered a sense of support, and almost pride, amongst London's TB community. In fact, as an agenda item it rarely appeared at

[20] This organisational innovation has not been replicated in any other sector, despite its well-known successes, demonstrating another instance in which the broader system was unable to co-evolve and adopt a successful subsystem innovation.

all, indicating its broad and quick acceptance within London's TB control system and the absence of controversy it generated. This is likely because cohort review is essentially a more systematised and sophisticated version of the well established practice of "case review", something with which healthcare professionals are familiar and comfortable: "the cohort thing is, I think, a version of a now very recognizable version of clinical practice. So it's saying to people, "do what you do, just do it better. This will help you do it better." (Former Director of Public Health)

Both cohort review and F&T identify gaps and shortcomings in the system and then address them– patients who are lost to follow-up, those who need DOT but who are not able to access it, and those who have not completed their treatment. The two initiatives are highly complementary, with cohort review's findings validating the necessity of F&T's work. F&T are unwavering in their support of cohort review, making the vastly differing fates of each of these initiatives particularly ironic. However, the behaviour and motivation on the part of the NHS has been consistent – in their responses to both cohort review and to F&T their objective has been to enhance control and measurement within the system, as would be predicted when the initiatives are analysed through a New Public Management lens. From the perspective of the mainstream NHS, cohort review embeds a further means of control and measurement and does so with the full support of its workforce.

As with F&T, the HPA was engaged to conduct a formal evaluation of the pilot of the cohort review program. The conclusions were highly positive. The following outcomes were reported from the pilot project, all of which are consistent with those reported over the decades from elsewhere in the world:

- *Improved treatment completion rates, from 82% to 90%, including among those with a social risk factor.*
- *The proportion of smear positive pulmonary TB patients receiving DOT (i.e., the most contagious subsection of an already contagious population), and with one or more risk factors, increased from 42% to 67%. (NB – this is still well below 100%, as per all official treatment guidance, with the rate falling considerably lower than 67% when all pulmonary TB patients are included.)*
- *A reduction in proportion of "lost" patients, from 2.5% to 0%.*
- *The proportion of smear positive pulmonary TB cases who had one or more contacts identified increased from 79% to 100%*
- *The proportion of smear positive pulmonary TB cases who had five or more contacts identified increased from 50% to 69% (NB, in New York City, five contacts is seen as the minimum acceptable number for all TB cases)*

  (Health Protection Agency 2012[a])

Perhaps not surprisingly, the report identified two related structural issues within London as limiting the ultimate success of Cohort Review: "the current service configuration" and the "fragmented nature of the structure of TB services across London". "Limited resources" was cited as a further limitation.

Unlike the HPA's last evaluation of F&T, which was the subject of both derision and suspicion by the NHS, the Agency's report on cohort review was accepted without question and has formed the basis for the expansion of the program across London.

Summary of Case Study Four

This case study has compared and contrasted two nurse-led, self-organising and highly complementary initiatives within the London TB control system. The emergence and subsequent success of F&T presented the NHS with challenges, mostly related to its desire to control and risk manage a team which, arguably, was successful for the very reason that it was not micromanaged and was able to develop an entrepreneurial and risk taking culture. When its multi-year pilot funding from the DH ran out, the NHS seized the opportunity to exert its control over the Team, consistent with NPM principles of risk management and desire for control. The NHS long-term goal may be to absorb the services offered by the F&T team (but not the Team itself) into mainstream TB service offerings. At the time of writing, the Team has been operating within the confines of an NPM-inspired NHS contract for approximately one and half years. The TB clinics and individual patients using the Team anecdotally report little difference in the service they receive from the Team, and the Team's own activity reports indicate they have been as busy as ever. The team, however, reports being stretched to its breaking point, as it scrambles to meet growing demand for its services with fewer staff and a smaller budget. A significant part of F&T's success is attributable to their unorthodox, boundary-spanning and often risky work practices. It remains an open question as to how long this can be maintained under the current NHS-led arrangement.

The long overdue emergence in London of the cohort review process, on the other hand, has been without incident and is enthusiastically supported by the NHS. The program is now in place across most of London and, unsurprisingly in light of 40 years of largely positive international experience, it has been favourably evaluated by the HPA. Cohort review reinforces the NHS interest in measurement and control, consistent with NPM principles, and unlike F&T, it does not introduce "strange" or risky elements

into the broader TB control system, thereby keeping system diversity in check and reducing risk.

With regard to complexity theory, both of these initiatives represent examples of self-organising behaviours. In the case of F&T, it also exemplifies non-linearity in that a chance meeting between an enterprising London TB nurse and a Dutch physician led to the eventual creation in London of the Find & Treat team. Scholars argue that diversity within a system increases its robustness, following Ashby's rule of requisite variety (Leifer 1989, Axelrod & Cohen 2000). This theory seems to hold true in the New York City Bureau of TB Control where this highly successful operation includes an array of medical, social, administrative and operational functions. Similarly, but on a smaller scale, London's Find & Treat team is also comprised of a variety of medical and non-medical functions. However, having succeeded in its efforts to take over F&T, NHS London is now struggling to accommodate the diversity which defined the Team. So far at least, the NHS response has been to try and reduce, or control, this diversity, rather than embrace and exploit it, another effort at risk management. This approach can also be seen as exemplifying self-organisation, this time to protect the NHS status quo and its own interests, a mode of self-organisation which was highlighted in Chapter Three. In effect, both negative and positive instances of self-organisation are seen within this case.

This concludes the presentation of the mini case studies, although their content will be further analysed as well as theorised in the following chapter. Next, empirical observations and the key inductive finding of the research are presented.

The Low Ranking of TB Control on the Public Policy Agenda: A Key Inductive Finding

As discussed earlier, the low policy priority accorded to TB control in London emerged inductively as a major finding during the research. The extent and the consistency with which this finding arose meant it could not be overlooked.

As discussed in Chapter Five, the software analysis program HyperResearch assisted with coding data and validating inductively emerging themes. Appendix L contains a bar graph illustrating the frequency of the various codes used. A key inductive finding, as seen in this bar graph, is the strong sense amongst respondents that no one outside the TB community cares about, or prioritises TB control as a policy issue, with respondents frequently referring to TB as "a Cinderella service". Based on this

observation, combined with other empirical data presented earlier, TB's low priority on the policy agenda is seen as the root from which other observed organisational phenomena grow[21]. A graphic representation of this relationship is suggested in Figure 29.

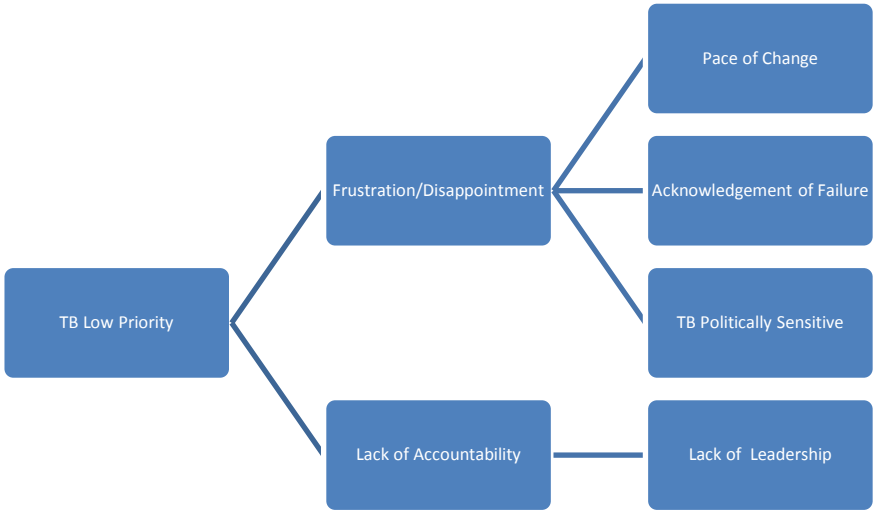


FIGURE 29: RELATIONSHIP AMONGST TB'S STATUS AS A LOW-PRIORITY ISSUE AND OTHER OBSERVED ORGANISATIONAL PHENOMENA

Respondents, unsurprisingly, displayed much frustration, or worse still, resignation and acceptance, at the system's failure to control TB. Some had quit the system in despair. More than one respondent became angry or upset during interviews and clearly valued talking to an outsider. Absent organisational accountability was identified previously as contributing to London's inability to reduce TB. This lack of accountability, it was argued, arises from the extensive fragmentation and decentralisation within the system, given embedded NPM practices. Whilst it is useful to understand the likely structural source of this lack of accountability (NPM), the related general issue of the low policy priority accorded to TB control must also be analysed in more depth. Specifically, understanding why *and how* this situation arose and persists is necessary. Appendix L shows the extent to which these phenomena

[21] Taken together, the phenomena outlined in this graphic account for almost one-quarter (7/31) of this research's total applied codes (of which all seven emerged inductively), and for 33% (1400/4305) of all coded phenomena.

prevailed. As can be seen, the second and fourth most commonly occurring codes were "TB low priority" and "frustration/disappointment", (and much of what is captured by the third most common code, "internal politics" also pertains indirectly to these issues).

" 'For God's sake, this is a major priority, what are you doing?'...TB is nowhere ...there is no interest"

Chapter Two described the epidemiology and history of TB in London, showing it to be predominantly a disease of the foreign-born and the marginalised. White, middle-class Londoners are largely unaffected by the disease and unaware of living in its presence. As one former director of public health observed, "We had 69 deaths last year from TB. Presumably, none of them actually sort of (pitched) up at Hampstead dinner parties...".[22] A respiratory consultant noted similarly:

> *one of the problems is not every disease entity is treated with the same degree of importance...because of who has it. TB is a disease of the poor... often the disease is in people whose first language is not English and they're not able to express themselves.*

At a population level, this research validates Dievler and Pappas' (1999) conclusions regarding the role of race and class in impacting the official policy response to TB. With over 80% of all TB cases in London occurring amongst the foreign-born, and the remainder within various marginalised communities, the "face" of TB in London today differs significantly from that of the first half of the 20th century when most of those infected were white and British-born. Place of treatment now differs significantly, too. Whereas sanatoria were common until the 1970s, they no longer exist, deemed too costly given falling TB rates and inappropriate from a civil liberties perspective. Nonetheless, sanatoria comprised a physical manifestation of society's recognition of TB as a healthcare priority and its commitment to healing those afflicted.[23] Members of London's TB community accept it as a "given" that the composition of the TB patient population impacts the nature of the policy response. There is a widespread sense that TB does not receive the attention it would if it were striking more affluent communities. On more than one occasion, the sentiment was voiced that "we need a middle class person to contract MDRTB" if the issue is to be taken seriously (which is what precipitated New York City's aggressive response to its TB epidemic).

[22] In fact, there were 83 deaths attributable to TB reported in London during 2010 (HPA 2011[a])

[23] There is some interest within the London TB community in reintroducing a modernised version of sanatoria, but it seems largely to arise from concerns about high levels of homelessness amongst TB patients.

A potentially fatal *communicable* disease against which it is difficult to protect oneself, and described by an NHS official as a potential public health "time bomb", has been allowed to grow in London, unabated, for over two decades. This fact alone speaks to the low priority accorded the issue. Each of the case studies presented earlier provides (sometimes tacitly) more detailed evidence:

- The virtually unchallenged (either from within the TB community or from higher levels within the NHS or Department of Health) decision to jettison the holistic Control Board concept in favour of a vaguely enhanced, yet essentially status quo, Commissioning Board, despite evidence from New York City that the former approach is arguably more effective;
- A reticence to adopt proven best-practices from other jurisdictions (New York City, Holland and Tanzania, from within London itself) without having to account for this approach;
- A dangerous drug resistant TB outbreak, uncontrolled for 13 years, without apparent pressure by senior health officials to end it;
- A TB control regime within the prison system which, for years functioned at a sub-standard level as part of the overall (inadequate) prison healthcare system, eventually becoming the original source of the 13-year InR-TB outbreak, and an ongoing contributor; and,
- A poor HPA-NHS interface was allowed to persist in the area of TB control in London without apparent senior leadership intervention.

Members of the TB community have accepted, and indeed promulgate, the categorisation of TB as a "small" disease, characterised by low numbers of patients (approximately 3500 per year) relative to conditions such as diabetes, cancer and heart disease[24]. Whilst this is true, curiously, only a few respondents qualified this observation by highlighting the communicability aspect of TB and that there is very little one can do to prevent catching it, or transmitting it (before diagnosis). One exception was a TB nurse who observed, "My public health message is 'don't breath'...because it's an airborne disease and there's a lot less choice going around in terms of transmitting TB than there is with blood-borne viruses", such as HIV and hepatitis. Patients, too, are disinclined to draw public attention to the need for better TB control, owing to the stigmatisation of the disease in minority communities and the socioeconomic characteristics, i.e., the powerlessness, of the patient base.

[24] Interestingly, few people would likely characterise HIV/AIDS as a "small" disease, and it infects fewer Londoners annually than does TB (HPA 2012[e,f])

Respondents repeatedly characterised TB control as a "Cinderella service". One TB consultant observed, "If I were a cardiac-thoracic surgeon I wouldn't be worried about where I am going to relocate my clinic after it's been demolished." And in the words of another, "TB is notoriously good at being a bit of a backwater". Not surprisingly, PCTs used this categorisation of TB as a "small disease" to justify according it a low place on their priority lists. In the words of a Chief Executive:

So you could say it's the PCTs' problem but it's never going to be large enough in any one PCT. Of all the things the PCT has got to worry about, the number of TB cases is never going to be so large that they think they need to do something.

A former senior PCT manager offered a similar sentiment:

the thing about TB, is that the attitudes of the PCTs, i.e. the Director of Public Health and the Chief Executive of PCTs, is often one of mild irritation. And the characteristic comment that you'll get is, "oh TB isn't even on my radar." And that's because, again, the numbers are very small.

Neither is there Evidence of Political Commitment

Not only is there little recognition of TB in London as a problem, equally there is no political support for addressing it. On one level, the reason is obvious, as powerfully summarised by a TB consultant:

> *It's a disease which affects foreigners. It affects the poor. It doesn't really affect voters. And it's also been an embarrassment politically to accept that it's still there and it's a problem. You know, it's like saying "we need a report in to child labour in London".*

However, at a less obvious and more systemic level, political concerns extend beyond potential embarrassment. A very senior manager within the system observed bluntly at a TB Commissioning Board meeting, "my total frustration is the total lack of interest in TB by political people...There is nobody who has ever championed it...". A surprising discovery of this research was learning of a blunt, clear, and unwritten code coming from senior levels of NHS London that the TB issue was to be kept quiet and not become a media or political issue in London. It is an open secret within the TB community that the brief from senior NHS management is to keep TB out of the news, "off the radar" and far from mainstream society's consciousness. A very senior level respondent said of senior NHS London management:

they are being defensive rather than proactive. They are not ready for TB to be a big issue: 'we don't want to have a huge whereabouts bloody mobile X-ray van. Just make (TB) go away'...I do think there is a genuine public health sense that this isn't very good, but...I suspect there's 2000 other targets and deliverables they have and until a Minister or somebody says "what about TB?", they won't focus on that... I'm sure they all, somewhere in their heads, it's on the radar, but because either politically or whatever, or because we haven't had a serious problem, it just doesn't ever quite get into the "now we must take action" category."

Field notes record similar sentiments being openly shared with members of the TB Commissioning Board on at least two separate occasions. Curiously, despite hearing what might be considered a startling observation, there was no reaction observable from Board members. It was not clear whether this was a result of their widespread resignation, whether this was "old news", or whether it is further evidence of the self-censorship discussed earlier. Similarly, a respondent shared that another informal, unwritten instruction from senior NHS and/or Department of Health management was that the term "epidemic" in relation to TB in London be dropped from usage in the run-up to the London 2012 Olympics. The TB community seemingly acquiesced and the word is nowhere in the TB control lexicon. In a masterful display of understatement, written documents use language such as "TB in London is at rates generally considered high".

Various respondents suggested that the nature of TB means it is destined to second-class public health status. One former director of public health, referring to senior NHS London management, commented that individuals there have their own professional agendas, "and I don't think a difficult and unpopular thing like this (TB) was necessarily going to get up (their) list." The widespread, tacit acceptance of TB's low status within the NHS London is disheartening for those working within the TB control system, as mentioned earlier. A senior nurse, seen as a leader within the TB community, observed: "for many years, we didn't really get managed...We got a phone call about once every three months from someone... we didn't have a clear management structure and there's nothing more demoralising.."

At the same time, senior management within London's TB control system were doing their part to comply with senior NHS London wishes that the city's TB problem be kept as quiet as possible. On at least four occasions, the TB Commissioning Board was informed that various media outlets (The Times, BBC, The London Evening Standard)

were interested in writing or producing stories on TB in London. The instruction to the communications officials was to either try and kill the story (the preferred outcome) or, if that did not work, to co-operate with a view to minimising potential damage and ensuring reporters were clearly told that NHS London was apprised of the issue and doing all it could to tackle TB. These efforts were largely successful, as during the course of this research only one major (front page) story emerged on the issue, in The Times (3 June 2011), and was limited to the issue of TB vaccines for children. Subsequently there has been a BBC Radio 4 documentary on TB in Britain, which first aired on 31 July 2012. It is not known whether there has been any fall-out within the London TB community, but it seems unlikely. The BBC production was focused on the increase in TB in migrant communities in Birmingham and suggested more resources for improved screening and treatment of latent TB. It was critical of NHS efforts, but non-alarmist and balanced in tone. As this thesis was being finalised, The Times carried another prominent story on the rise of TB, on 7 December 2012.

It is interesting to note the absence of any "whistle blowing" activity from within the TB community. With media interest, it would not be difficult for someone from within the London TB community to speak out. A key respondent disclosed that s/he had seriously considered this option, but decided against it.

> *Respondent (R)...all the steer from the bureaucracy was don't do that. It won't help your cause in the long run. And that's a judgment as a (post redacted) you have to make, do I really want to go public and get, you know, because what will happen is I would go public, say loads of things probably that would be pretty difficult and the DH and the SHA would rebut.*
>
> *ST: Oh they would?*
>
> *R: Oh yeah.*
>
> *ST: You think they'd just let you ...?*
>
> *R: Oh yeah. They'd say "(name redacted) doesn't know what (s/he's) talking about. This is what's actually happening, here's what we're really doing. (S/he's) misunderstood it." Yeah, yeah. They would have no, if it got really dirty, that's what they'd do.*
>
> *ST: They'd just hang you out?*
>
> *R: Yeah. So in a way, there was no point in trying to push it, and I think it's a shame. I think it's a shame.*

Other well-placed respondents mused about the potential long-term value of loud and negative media attention. A former director of public health mused:

> *...do we need two serious XDR[25] cases including a death in Newham in July 2012 to wake everybody else up for the Olympics, when the Daily Mail will then run a scare story, "TB Epidemic Strikes East London" before the Olympics..."Olympic Health Scare"? Do you need that? Well, actually, maybe we do because then maybe there will be some leadership. And if I sound pissed off, it's because I am.*

There is little political gain in championing improved TB control in London. At the elected level, in the words of a former director of public health, "'he cracked TB in London', that's about two and a half votes, you know, it's invisible (TB). The people who'd be grateful are very unlikely to vote, most of them...". At the same time, a risk assessment could conclude that after 25 years of slowly climbing TB rates, the chance of a crisis erupting is small within an electoral mandate. And should such an event arise, senior levels of the system could point to many actions taken over past years in response to the rising rates of TB in London (whilst ignoring their summary lack of effectiveness).

This concludes the presentation of the key, inductively derived, empirical finding in this research, in which the low organisational and political priority accorded to TB control in London, and the serious consequences flowing from this status has been revealed. As with the other empirical findings presented in this chapter and in Chapter Six, this finding will be theorised at some length in the next chapter, in this instance using Kingdon's (1995) theory of public policy development.

Before moving on to identifying the mid-range themes which have emerged from the case studies and concluding remarks for this chapter, it is useful to return to the theory of professional dominance and its role in this research.

The Theory of Professional Dominance Revisited

This chapter and its predecessor tacitly illustrate, mainly by way of its absence, the role of medical dominance within London's TB control system. This was most clearly shown when TB consultants quickly dropped their opposition to NHS management's move to drop the TB Control Board concept and revert back to a Commissioning Board model. Although almost all respondents identified TB physicians as being the most dominant group within the TB community, their power remained oddly unexercised outside of

[25] "extensively drug resistant"

their individual clinics. Field notes indicate they did tend to dominate meetings verbally, but as they often arrived late and left early owing to their busy schedules, even this form of influence was limited. The reasons for this lack of observed "operationalised" medical dominance are not entirely clear. Speculatively, it could arise from a lack of slack or redundancy in the system, meaning doctors simply do not have time to significantly influence TB control in London. For even the busiest TB consultants in London, TB occupies no more than 30% of their time (COPD and asthma comprise the major clinical issues), despite apparent high commitment to their TB patients and to improving the TB control system. Perhaps related to this, neither was there evidence of robust ties (nor many of them) amongst TB consultants, thereby reducing the potential of beneficial self-organisation emerging amongst the group. Consequently, it's been concluded that the theory of professional dominance does not provide a strong or viable conceptual framework for understanding TB control in London and it will not be analysed or theorised more extensively.

The remainder of this thesis will focus on the theoretical development and application of complexity theory and NPM concepts. Below are summary tables of the empirical data and the key complexity theory and NPM features observed.

Complexity Theory Concepts	**An Analytic History of TB Control in London**	**Comparative Case Study: London vs. New York City (NYC)**	**Case Study: Drug Resistant TB in London (HMP Pentonville)**	**Case Study : The Creation of the HPA**	**Comparative Case Study : Find & Treat vs. Cohort Review**
Self-organisation	Not applicable	Actors self-organised to maintain London status quo	No evidence	Not applicable	Both initiatives examples of self-organisation. NHS takeover of F&T also reflects self-organising behaviours, but to protect the status quo
Non-linearity	14 reports into TB problem in London, but no corresponding action	No evidence	No real change in system response despite strong environmental perturbations (the outbreak)	No evidence	Chance encounter with Dutch TB consultant led to formation of F&T
Role of historicity, sensitivity to initial conditions, context	Historical view of TB as "Cinderella Service" may contribute to current system unresponsiveness; will be discussed in Chapter Eight	No evidence	History of poor prisoner healthcare likely contributor to current state	Creation of HPA part of a long history of NHS "hyper-reorganisations"	History of aversion to importing best practices likely contributor to late arrival of Cohort Review. Historical "need to control" in NHS contributed to F&T takeover.
Diversity in system	No evidence	Significantly less in London than in NYC	No evidence	Creation of a new agency added diversity to a system, but it was not capitalised on	F&T offers non-TB services, e.g. housing advice, dental services
Co-evolution/ co-adaptation in system	No system-environment co-evolution	Not applicable	Co-adaptation notable by its absence, but sorely needed	No evidence	F&T added services as clients' needs dictated

FIGURE 30: SUMMARY OF COMPLEXITY THEORY CONCEPTS EMPIRICALLY OBSERVED

NPM Concepts	**An Analytic History of TB Control in London**	**Case Study: London vs. New York City (NYC)**	**Case Study: Drug Resistant TB in London (HMP Pentonville)**	**Case Study : The Creation of the HPA**	**Case Study : Find & Treat vs. Cohort Review**
Managerialism	Blaming ongoing NHS restructuring, senior NHS London management effectively derailed the London TB control system's latest TB strategy plan	NHS managers quashed Control Board concept	No evidence	No evidence	NHS management support instrumental in success of both Cohort Review and F&T demise
Quasi-markets, hollowing out, disaggregation	DH "out of TB business", HPA established, weak contracting function, highly fragmented system	Primacy of commissioning function contributed to demise of Control Board concept. Disaggregation leading to unclear system accountabilities also a factor.	Deep system fragmentation arising from internal market model has likely contributed to rise in drug resistant TB in London	HPA's formation represents hollowing-out of DH, disaggregation	F&T now being controlled by contracts
Control, risk aversion, measurement	Not applicable	Apparent NHS fear of losing control if Commissioning Board expanded to include more non-NHS stakeholders	Oddly absent. Uncharacteristic "gambling" by NHS London in ignoring drug resistant TB	No evidence	NHS London takeover of F&T driven by need to control, manage risk
Rights and role of the "consumer"	No evidence	No evidence	No, especially re: prisoners	No evidence	No evidence
Top-down pressure for reform	No, although such pressure justified	Not applicable	No, although such pressure was justified	The creation of the HPA a top-down initiative	Significant pressure on F&T from NHS London

FIGURE 31: SUMMARY OF NEW PUBLIC MANAGEMENT CONCEPTS EMPIRICALLY OBSERVED

Before moving on to some concluding remarks, it is helpful to identify relevant mid-range themes arising from this case study data, and which will be more explicitly theorised in the next two chapters.

Mid-Range Themes Identified From the Empirical Data

1. **There is a high degree of NPM-style fragmentation throughout London's TB Control system.**

As discussed in Chapter Four, conditions of high fragmentation can arise from operational decentralisation (e.g., 31 TB clinics across London, of which only those five in North Central London share some resources) and/or fallout from well embedded macro-level NPM reforms in the NHS. In this study they have resulted in, specifically:

(i) the creation of a commissioner-provider split which prevented the emergence of a holistic pan-London TB Control Board;
(ii) the creation of the arms-length and seemingly uninfluential Health Protection Agency;
(iii) outsourcing and proliferation of the number of stakeholders in the field, including privatised laboratory and prisoner transport services, contracted-out services providing a TB awareness-raising campaign for GPs and for the diagnosis and care of TB patients from high-risk communities (F&T, which was initially governed as a social enterprise):
(iv) poorly implemented contractual performance management reporting regimes; and,
(v) a hollowed-out policy making capacity at the DH.

Whilst all these NPM-inspired reforms are present and appear generally to exert negative effects at the TB system-wide level, other NPM reforms which may have been helpful appear weak or absent. The use of targets is a strong NPM policy instrument, designed to galvanise action around particularly visible policy areas (such as NHS waiting times), but this research found no officially sanctioned targets relating to either TB rates or the delivery of specific TB services. With over 70% of PCTs not having Service Level Agreements in place for TB (Laycock et al 2009), performance measurement and audit tools generally are not used in this field. Similarly, there is no "steer" or pressure to perform emanating from the centre, perhaps reflecting TB's low profile as a health policy issue (as explored in Chapter Eight).

Also, as a deeply fragmented TB service has been the norm in London for so long, it was easier for NHS managers to set aside the holistic TB Control Board concept in favour of a vaguely modified status quo, aided by the lack of opposition from TB physicians. Finally, a further implication of NPM-style fragmentation is a severe lack of

accountability within the system, related in part to the above-noted lack of rigorous contracting practices and officially set targets.

2. **The public health function is impeded and weak**

As also discussed in Chapter Four, the public health function, with its systemic focus on holism and the need for co-ordinated, multi-organisation working, is impeded and lacks influence within strong NPM environments. The case study of the HPA suggested its weak influence on core agencies. This problem is expected to be exacerbated as a result of the recently passed health and social care legislation which will see the public health function split amongst local authorities, GP commissioning groups and (the yet to be created) Public Health England.

3. **There is little evidence of co-adaptation amongst TB system components**

Neither was there evidence found of co-adaptation between the TB control system and its environment, nor evidence of organisational learning (as complexity theory would predict, too optimistically). Rather, the ongoing production of similar reports on TB in London, along with repeated discussions on similar topics (i.e., the value of pan-London TB commissioning) speaks of "organisational forgetting". Similarly, the refusal or inability of clinics to adopt successful best practices from other jurisdictions or even local clinics (Trenholm & Ferlie 2012), the apparent difficulty the NHS had in working with the HPA, and the failings of TB services in prisons are reflective of a maladaptive, non-robust system, including games around narrow turf defence.

Mid-Range Themes Arising Inductively

As mentioned earlier, some mid-range themes arose inductively during data analysis. The software HyperResearch proved helpful in validating these themes[26], as outlined below.

1. **The extensive and deep fragmentation which characterises the system** (as discussed above)

2. **The low priority accorded TB as an issue and, flowing from this, an absence of political support, and a lack of accountability and leadership within the system.**

[26] Please see Appendix L for a graphical presentation of the frequency with which the codes used for data analysis appeared.

These concepts are closely related and manifest in TB being frequently characterised by respondents as a "Cinderella service" which is easily ignored. This lack of priority given to TB control is an important finding and will be discussed in Chapter Eight. As noted earlier, NPM-led decentralisation and fragmentation makes it easier for responsibility (and blame) to be shifted, or avoided, by pushing it down to ever lower operating levels. This was observed within this research as virtually no one within the system held, or claimed, responsibility beyond their local "patch" or patient population. The absence of accountable leadership within the TB control system, and crucially, at a higher level within NHS London, means the TB "situation" has been allowed to deteriorate, with no one being held accountable.

Finally, an additional theme surfaced which is not directly related to the organisation and structure of the system, but was a strong and recurring sentiment which should be noted; namely, a widespread and deep sense of frustration, often bordering on anger, amongst current and past actors within the TB control system at the lack of improvement and slow pace of change. As this is clearly related to the preceding theme, it too, will be discussed in more depth later.

Concluding Remarks

This chapter has presented much of the empirical data collected. Each case study illustrated different systemic relationships within London's TB control system, whilst also relating them to relevant aspects of the theory used in this research. A key inductive finding related to the low policy priority accorded to TB control in London was also presented and discussed.

The first case study in this chapter discussed drug resistant TB in London, with a focus on the role played by Pentonville prison and the organisational relationship between the prison health system and the TB control system. The sometimes strained relationship between the NHS and the HPA, with regard to the management of the outbreak, was also discussed. The outbreak is now in its 13th year and remains uncontrolled. Key components of the recommended approach to treating drug resistant TB – rigorous use of directly observed therapy and extensive contact tracing - are made more difficult by London's deeply fragmented and resource-scarce structure.

The next extended "vignette" discussed the impact on London's TB control system of the emergence of the HPA, a devolved, NPM-inspired, arms-length, agency. The creation of the HPA embodies the NPM process of hollowing-out formerly strong, central

government departments, in this instance, Health. One of the consequences of the formation of the HPA was further fragmentation within an already fragmented TB control system and the disempowering of a key group of TB control experts. As the relationship between the HPA and the DH is seen as unclear, both the nature of the HPA's autonomy and the resulting role of the DH in TB control were discussed.

The last, comparative, case study contrasted two self-organising initiatives: the establishment of the Find & Treat team and the cohort review process. Whilst the workings of the former were the frequent subject of suspicion and misunderstanding by the NHS, the latter was warmly embraced and its expansion across London encouraged. Eventually the NHS launched a "hostile takeover" of Find & Treat, a move which, it is argued here, was motivated by the NHS' NPM-driven need to control and risk manage the service provided by F&T. Cohort review, on the other hand, played into and supported this need, leading to enthusiastic support from the NHS for the initiative. Cohort review also offered no threat in terms of how it was executed – essentially as an extension of the well established patient case review process. At the time of writing, Find & Treat's mid-to-longer term future is still unknown, whilst cohort review is on its way to becoming a mainstay in London's TB control system.

A key inductive finding arising from this research was also presented. Surprisingly, despite being a potentially fatal, communicable disease which has taken hold in a densely populated urban centre, TB control in London is given scant priority by policy setters. TB is characterised as a "small" disease within NHS London and its treatment is seen as comprising a "Cinderella service". The implications of this characterisation were discussed and will be theorised fully in the next chapter.

In the final section of the chapter, an overview of the mid-range theories which arose both deductively and inductively from the empirical data was presented. These themes include deep fragmentation within the system which often results in misalignment, an absence of co-adaptation, a lack of accountability and leadership within the system, a virtual absence of political or high-level policy support for TB control initiatives, and widespread frustration amongst actors within the system.

This chapter, along with the one before it, has provided an extensive review of the data collected for this research and has introduced theoretical elements which are relevant to understanding the data. The next chapter will theorise these findings further to better explain the (non) functioning of London's TB control system.

CHAPTER EIGHT: Theorising the Explanatory Potential of Complexity Theory and New Public Management in TB Control Across London and the Lack of Public Policy Attention Accorded to TB Control in London

Introduction

The previous two chapters presented empirical findings from this study. This chapter will theorise specific aspects of these findings by revisiting the research questions posed at the start of this thesis. In particular, this chapter considers:

1. What is the contribution of complexity theory features (and/or professional dominance and/or New Public Management features) in analysing the organisational response to this phenomenon?

2. Why does the organisational response to resurgent TB in London illustrate these features?, i.e., what are the mechanisms and structures which explain this organisational response?

3. Does complexity theory provide a theoretical basis for understanding the role of the New Public Management paradigm and practices within this case?

4. What perspective might Kingdon's (1995) theory of public policy development offer on TB control in London?

These questions will be discussed in the context of both the findings captured by Figures 30 and 31 in Chapter Seven and the mid-range themes which were identified from the data and summarised at the end of that chapter. To recap, these themes are:

- the high degree of NPM-style fragmentation throughout London's TB control system;
- the scant evidence of co-adaptation amongst TB system components;
- the manner in which the public health function is impeded by NPM-based practices; and,

- the low priority accorded the TB control issue in London, leading to frustration and a lack of accountability.

In theorising these findings, special attention will be focused on the interplay between complexity theory precepts and NPM-based principles of organising. Specifically, how NPM is embedded, especially within the broader NHS, and to a lesser extent within the TB control system itself, is explored. This recognizes the need for complexity theory research to be mindful of the broader context in which it is undertaken (Marion & Bacon 1999, Rhodes et al 2011, Byrne 1998), in this instance a heavily NPM-influenced environment. And as mentioned earlier, Kingdon's (1995) theory on public policy agenda setting will also be used, so the key inductive finding of this research can be fully theorised. This exercise will be augmented by re-introducing some elements of complexity theory, as suggested by Kingdon himself.

Complexity Theory Precepts Widely Observed, But Often With "Negative" Manifestations

Complexity theory precepts identified for use in this research - self-organisation, non-linearity, and historicity/sensitivity to initial conditions were widely observed (Figure 30). The concept of "co-adaptation/co-evolution within the system" was found to exist in only a limited manner and within a single case study, the Find & Treat team. The clear lack of adaptive behaviours within the system is a significant issue and will be discussed later. In addition, there was a marked lack of diversity observed within the system. Also significant is the manner in which the complexity theory concepts often materialised within the system; namely, in ways which impeded TB control efforts.

Self-Organisation

Self-organisation is often seen as a "force for good", and this research found evidence of self-organising behaviours leading to beneficial outcomes within London's TB control system; specifically, the creation of the Find & Treat team and the Cohort Review process. Both of these initiatives exhibit most of the aspects of self-organising systems highlighted in Chapter Three: the absence of a single leader, the lack of an overarching plan or blueprint to guide actions, and the emergence of order and innovation. Both F&T and Cohort Review were initiated by nurses but neither started out with a grand scheme and the nurses involved in the early days of the programs expressed some surprise at the eventual outcomes.

However, self-organising behaviours may also exert detrimental influences on their host system (Boons et al 2009, McKelvey 2003), and in this research they often did. Chapters Six and Seven identified instances in which NHS management self-organised to maintain the status quo, impeding much needed system change. The first of these was the reaction by system actors, or more accurately the non-reaction, to the many commissioned reports and studies looking at how to better manage TB in London. While there was no evidence that these reports were formally rejected, there was a pronounced "non-response", or a response cycle comprised largely of ignoring the latest report and then commissioning another one shortly thereafter.[27] Similarly, system members were observed to self-organise in the context of the F&T "takeover". Although there were concerns amongst NHS managers regarding the lack of governance and the unorthodox and far-reaching work practices within the Team, there did not appear to be a specific "plan" or single leader in place who was driving the "takeover initiative", until the Team's last days as a social enterprise. What was observed was a tacit agreement amongst some NHS managers that the time had come for the Team's activities to be brought under the health service's purview. It is not possible to identify a single, clear motivation for this action as the Team was successful, cost effective and well regarded outside the aforementioned group of NHS managers. The impetus was not financial, as it was recognised that the money spent on F&T would not be redirected to other parts of the TB control system in the event of F&T's demise, but would simply "disappear" into the broader NHS. It is conjectured here that the anti-F&T drive is a general reflection of a well-established culture of control and risk aversion within the NHS. The third, and perhaps most "pure" or conservative manifestation of self-organisation involves a series of clearly uncoordinated, individually motivated behaviours by senior NHS managers, the net result of which is TB's on-going status as a low-priority, unsuccessfully managed, healthcare issue. This particular instance of self-organisation is described and theorised at some length in the next chapter.

Non-linearity of Response

Complex systems often exhibit non-linear responses to disturbances in their environments, sometimes leading to the emergence of novelty or innovation (Holland 1992, Manson 2001, Plsek 2001). A positive instance of non-linearity noted above involved the chance meeting between an enterprising TB nurse and a Dutch TB doctor

[27] The DH Commissioning Toolkit represents a minor exception to this, as some of its contents appear to have been used by some PCTs and commissioners.

which led to the eventual creation of F&T. However, most instances of observed non-linearity did not contribute positively. After 14 reports outlining the need for action to be taken against TB, the system remains steadfastly moribund. Similarly, despite a strong environmental perturbation in the form of the InR-TB outbreak, the prison healthcare system remained unresponsive for years. When it finally did act, the response was inadequate and poorly executed. On a more macro level, non-linearity is evidenced by the system-wide non-response to rising drug resistant TB rates in general. So as with the observed instances of self-organisation noted above, most of the examples of non-linearity also contribute negatively to TB control.

Historicity and Sensitivity to Initial Conditions

It is admittedly challenging for a deadly communicable disease like TB to develop a positive history within an organisation. Nonetheless, as noted earlier, history and the initial system conditions it creates are important considerations in complexity theory research (Begun et al 2003, Rhodes & McKechnie 2003). As with the self-organisation discussion, above, there were also negative manifestations of these concepts within London's TB control system.

The TB service's longstanding history as a low priority, "Cinderella service" is perpetuated, with negative outcomes for the system. As will be discussed in the next chapter, this metaphor has become a self-fulfilling prophecy of sorts, making it easier for policy makers to disregard the very real needs of the system. History also affects how the poor quality healthcare traditionally provided to London prisoners impacted the system's response to the InR-TB outbreak. Whilst the current prison healthcare situation may be a slight improvement on the past, and in some prisons TB facilities have improved, historically prisoners have been subjected to well documented substandard levels of care (Siva 2010), including those infected with TB. Arguably, this contributed to prison health officials' inadequate response when faced with the InR-TB outbreak. Similarly, a lengthy history of ignoring best practices from other jurisdictions likely contributed to the late arrival in London of the cohort review process and to the city's on-going ambivalence toward implanting a full-scale DOTS program. The next chapter further discusses the importance of historicity and initial conditions, reflected in the impact of the state of the UK's political economy when resurgent TB returned to London (NPM) compared with the arrival of HIV/AIDS in the early 1980's (pre-NPM).

Co-Adaptation and Co-Evolution

Co-adaptation increases system fitness by ensuring that systems are aligned with their ever-changing environments (Leifer 1989). Systems successfully adapt if "the entire ecology…evolves; (when) individual subsystems contribute to, and are affected by, the whole system's evolution" (Goldstein et al 2010:32).

Empirically, there was almost no evidence of co-adaptation or co-evolution within the system, save for the F&T subsystem's observed responsiveness to its clients' wide-ranging needs, as the team became aware of them. On a more macro level, most of the observed evidence pointing to a lack of co-adaptation overlaps with observed non-linear responses, underscoring the importance of these observations. The TB control system did not successfully co-adapt to the very significant environmental changes resulting from over two decades of rising TB rates, or to the serious appearance over a decade ago of drug resistant TB. As well, the system engaged in "organisational forgetting" rather than organisational learning, failing to co-adapt to changes in its environment with, for example the introduction of new reports and recommendations.

On a subsystem level, HMP Pentonville was very slow in adapting its TB control practices to the outbreak of InR-TB (a significant environmental change), and when it did, it engaged in a variety of often unsuccessful infrastructure and process changes. The prison healthcare system (run by the NHS) was unwilling or unable to communicate and work with other parts of the NHS to ensure its TB facilities were adequate, demonstrating further evidence of poor organisational learning. For Mitleton-Kelly (2003:42), "(w)hen learning leads to new behaviours, then the organisation can be said to have adapted and evolved". By this measure, London's TB control system has neither adapted nor evolved, as is consistent with the evidence collected by this research.

Diversity Amongst System Components

Diversity within systems is important for enhancing robustness and fitness because it

> *provides a wide range of possible responses to any given situation. The wider is the range of variations, the more likely it is that (at least) one will become viable in furthering the adaptability of the whole* (Goldstein et al 2010:179).

As noted, the London TB control system is medically dominated and there is no representation from outside the NHS or DH, aside from some sporadic involvement by

former TB patients. Even before they were subsumed by the NHS, there was no F&T representation on either the TB Commissioning Board or the TB Clinical Working Group. Respondents noted the dominance of the medical model in London's TB control system and the absence of a public health approach, as seen in Appendix L, reflecting a lack of diversity of viewpoints within the system. Had the Control Board idea been implemented, this might have enhanced both public health input and diversity of opinion and experience, through the intended involvement from social care interests, including housing, as well as the Mayor's Office.[28] Instead, the system features a marked lack of diversity[29] and, arguably, as a result, is less able to respond to environmental challenges.

As can be seen, complexity theory precepts were only observed as manifesting positively within the original F&T team and not within the London-wide system. Elements of the TB community self-organised in ways which prevented much needed change and adaptation within the system, displaying the sort of negative self-organisation discussed by Boons et al (2009) and McKelvy (2003). In turn, these behaviours contributed to the observed lack of system co-adaptation and its non-linear responses (i.e., non-responses) to significant disturbances to the TB control system (rising TB infection rates and drug resistant outbreaks). In the absence of co-adaptive behaviours, systems become increasingly misaligned with their environments (Leifer 1989), failing to adopt vital "self-repairing" changes (Mitleton-Kelly 2003), as observed in the organisational response by London's TB control system.

NPM Precepts Also Widely Present, But With Some Variability

Along with complexity theory, the NPM precepts identified for application in this research were widely observed, as highlighted in Figures 30 and 31 in the previous chapter. The extent to which NPM serves as a useful conceptual framework for understanding London's TB control system came as a surprise. Particularly notable is the profound manner in which NPM impacted the expression of the complexity theory concepts found within the system and the extent of its ongoing presence. And just as the complexity theory precepts manifested in unexpected or unusual ways (often negatively and with negative outcomes), the NPM precepts also contributed in negative

[28] This was ultimately a "double-edged sword", as increasing diversity was likely perceived by the NHS as potentially relinquishing control, or at least making the Board more difficult to control.
[29] However, there are notable levels of ethnic diversity amongst members, and equitable gender representation.

ways to the system's efforts at controlling TB. This is less surprising given the previously discussed relationship between NPM and public health.

Below is a recap of the negative expressions within London's TB control system arising from various NPM precepts.

- Managerialism (Ferlie et al 1996:11,108,182-183, Diefenbach 2009)
    - derailing the last TB strategic policy plan (the Case for Change and Model of Care documents) by senior NHS London management
    - quashing the TB Control Board concept by London Health Programs (NHS) staff (with the support of more senior NHS officials)
    - the demise of F&T.

- Quasi-markets, hollowing-out, and disaggregation (McNulty & Ferlie 2002:56, Dunleavy 1995, Allen 2009)
    - Control Board concept set aside, owing, in part, to the primacy of the commissioning function over a more holistic approach to TB control
    - Unclear accountabilities arising from disaggregation, decentralisation and fragmentation
    - A loss of policy making capacity at the DH

- Control, risk aversion, and measurement (McNulty & Ferlie 2002:66-57, Moran 2003:153)
    - NHS fear of losing control contributed to the demise of the Control Board concept
    - F&T takeover largely motivated by NHS need to control TB service delivery

As with the complexity theory concepts, the NPM precepts sometimes also emerged – or not - in unusual or unexpected ways. For example, there is virtually no evidence of top-down pressure for reform coming from either the DH or the NHS (presumably owing to the low priority accorded to TB control), although such pressure is arguably needed. Neither is there any real evidence of performance measurement or enforced target-setting aside from a series of "metrics" which were developed by the TB Commissioning Board and Clinical Working Group and provided to PCTs and TB clinics. A presentation by the London Health Programs arm of the NHS on World TB Day 2012 described these as "a tool to measure progress rather than performance". In fact, the most recent data show that of the eight performance metrics currently in place, only

two have met the minimum acceptable standard, two have been deemed "not currently measurable" and four have not been met (Health Protection Agency 2011[a]:22). At the time of writing, these metrics were an on-going topic of discussion, with efforts to revise and update them underway. The Model of Care document also noted the need for more robust performance measurement. Yet this situation is atypical within an NPM context. It should not be construed as management lacking interest in exercising significant control over the system since the weight of evidence presented points in the opposite direction. Another key NPM concept which was surprisingly absent from the macro-level view of TB control in London was the desire to control outcomes via various risk management methods. Whist the mainstream NHS demonstrates a need to exercise control and manage risk at a micro level within London's TB control system (the F&T takeover), this is curiously absent in the health service's overall approach to managing TB in London. At this level, NHS London leadership can be characterised as gamblers, seemingly willing to take the chance that this communicable disease will be contained in both size and scope.

The next sections of this chapter address, through a theoretical lens, how NPM has impacted London's TB control system, with a view to identifying key contributing organisational mechanisms.

How NPM Impacts TB Control in London

A Deeply Fragmented System

Early concerns were raised about the potential impact of the NHS internal market reforms on TB control (Evans 1995, Ormerod et al 1994, Pearson et al 1996):

> *"The purchaser/provider split necessitates improved communication between the CCDC, the specialists in thoracic medicine...and the contract managers for the tuberculosis contact tracing service. This role may require the service of a part-time dedicated tuberculosis co-ordinator...Clear objectives and agreed targets for the prevention and control of tuberculosis in London should be set between commissioners and providers" (Pearson et al 1996:176).*

The authors foresaw the potential danger of fragmentation in TB control services along with the need to offset this risk by instituting a system of targets and measurement. Their apprehension was well placed. Just two years later, in the 1998 report *Tuberculosis Control in London – The need for change*, it was observed, "overall the service is patchy, fragmented and under-resourced" (Thames Regional Directors of Public Health 1998:2). As detailed in the previous chapter, this research has shown that

fragmentation continues to stunt London's TB control system, with no end in sight, as acknowledged by the TB Commissioning Board itself:

> *"There is the risk that the control of TB will become more fragmented as the responsibilities for protecting health and procuring services move into new and disparate organisations most of which will be unable to take a pan-London strategic view of the disease." (NHS 2011[a]:2)*

The introduction of the NPM-inspired quasi-market to the NHS and the ensuing contract-driven disaggregation within the TB control system (often achieved via outsourcing, e.g., GP awareness-raising initiatives, prisoner transport and laboratory services) facilitated system fragmentation. Where once there were relationships, now there are contracts. A leading microbiologist observed during a TB Clinical Working Group meeting how NHS employees cannot enter the Serco-run labs in his Trust without special permission (apparently to safeguard corporate competitive interests). Colleagues working in the same Trust who would have been able to informally mix with each other and develop workplace relationships now find this more difficult owing to the quasi-market.

Not all NPM-inspired disaggregation arose from outsourcing, however. With the creation of the HPA, the DH simultaneously hollowed-out its TB policy making capacity, further fragmented the TB control system and muddied already unclear lines of accountability. By downgrading its role in TB policy, the Department also sent a message regarding the low relative priority which it placed on TB control, thereby underscoring the damaging "Cinderella service" identity attached to TB. The implications of this will be explored in the next chapter.

NPM systems do not feature the traditional methods of accountability associated with bureaucratic and hierarchical modes of organising (Allen 2006, Pollitt 2005:381). Rather, these systems move decision making power to ever more localised levels, thereby increasing system fragmentation. At the same time, these systems implement a regime of contracts, targets, audit and performance management to maintain some element of control by the centre, resulting in a contradictory model of simultaneously loose and tight controls. Finally, intra-system communications become more complicated within fragmented systems, with organisational learning often negatively impacted, i.e., vital system co-adaptation and co-evolution is more challenging in the presence of system fragmentation. London's TB control system epitomises these characteristics.

Lack of Accountability Within the System

Early warning bells were sounded regarding the risk of NPM-led fragmentation on TB control, as well as concerns about accountability within the system: "How should tuberculosis services be provided and purchased and who should manage both the patients and the programme and so be held accountable?" (Ormerod et al 1994:1088). And as with the concerns regarding the impact of fragmentation, this fear has also been realised.

Accountability within NPM systems differs from that found in traditional bureaucratic and hierarchical systems. By pushing decision making power down to the lowest possible system levels, accountability becomes highly diffused, indirect and often contract based, with few political or visible lines of accountability. NPM advocates argue the risks of this diffusion are offset by the simultaneous implementation of a rigorous regime of performance measures, targets and audits. While this approach can be effective where it is employed, in the case of TB control in London, it simply does not exist. As noted above, there is no system of performance measurement in place; consequently, "(w)hile metrics have been developed for TB and are regularly reviewed, active performance management is not comprehensive across the city" (NHS 2011[a]:7). NHS-enforced targets are also absent for the TB control system as a whole (e.g. a target rate for TB incidence or DOT usage across London) and for individual components of the system (e.g. well-defined treatment completion rates per clinic). [30] Nor was any evidence of audit activity observed (readers may recall that despite significant efforts, NHS London was unable to determine exactly how much money is spent annually on TB control in London). Ironically, the sole exception is the F&T team since its takeover by the NHS. Under the terms of the detailed contract discussed in Chapter Seven, the Team find themselves subject to a level of performance management and measurement exceeding that found anywhere else in the TB control system.

Similarly, the contracting regime in place between purchasers and providers of TB services in London is poorly developed. Strong contracts are another means by which the potentially negative impacts of decentralisation, i.e., fragmentation, are offset. However, as most PCTs do not have Service Level Agreements in place with their TB service providers, but rather combine TB services within broader contracts for respiratory services, again a potential counterbalance to system fragmentation is not in

[30] For a brief time circa 2000-2002, NHS London adopted one TB-related measure in its list of "official" targets - the overall treatment completion rate.

place. For TB control in London, the situation can be seen as representing the worst of both NPM worlds: a fragmented system (arising from decentralisation and localisation drives) without the offsets of a performance management and targets regime or strong contracts. NHS London has not delegated any authority or power to the Chair of the TB Commissioning Board, compelling the Chair to rely on goodwill and collaboration to implement system change. The net result is an almost total absence of accountability at the system level.[31]

NPM Suffocates Complexity Theory Concepts and Potential Benefits to System

The preceding discussion has (a)reviewed the nature of the complexity theory concepts observed, including their often negative or non-manifestations within London's TB control system and (b)established that NPM is deeply embedded within London's TB control system and the broader NHS. This latter point provides an important theoretical underpinning for understanding how and why the system functions as it does. Figure 32, below, brings these two points together, providing a summary overview of this chapter's discussion thus far.

[31] London's situation contrasts with New York City's centralised, clear and hierarchical organisational structure. There is no doubt as to who is directly answerable for TB control there -the Director of the Bureau of TB Control.

Complexity Theory Concept and Observed Negative Manifestation or Absence	NPM Concepts Implicated
Self-Organisation (negative) - actors self-organised to maintain the status quo. • Reports and studies ignored despite clear need and calls for change • Control board concept repealed in favour of status quo Commissioning Board • F&T takeover • TB's status as a low healthcare priority reinforced by TB community itself	○ *NPM-driven need to control* supported negative self-organising behaviours which: • ignored reports and studies (implementation could lead to unpredictable changes) • led to quashing of holist Control Board concept (potentially too many non-NHS actors, leading to reduced control) • supported F&T takeover • perpetuate TB's status as low priority ○ *Managerialism* underpinned demise of Control Board idea and, at senior NHS levels, derailed the latest strategic policy alternative ○ *Quasi-markets* resulted in primacy of commissioning, leading to demise of Control Board concept ○ *NPM-led efficiency drives* reduced system slack and redundancy, making the formation of potentially productive ties amongst system actors more difficult
Non-Linear Responses (negative) • System unresponsive at both micro level (prisons) and macro level (overall system) to drug-resistant TB despite significant environmental perturbations	*Fragmentation* within system, arising from quasi-markets, makes it difficult to co-ordinate an effective response to outbreak and easier to avoid accountability for such a (non)response
Co-adaptation (absent) • At macro level, inability of TB control system to respond to resurgence of TB in London, including drug resistant TB • Ineffective changes in TB control infrastructure and processes in HMP Pentonville; existing, extensive NHS expertise ignored • No evidence of organisational learning. Reports saying largely the same things repeatedly produced and their contents forgotten.	*Fragmentation* across system, arising from quasi-markets, combined with lack of leadership, makes it difficult to facilitate cross-system communication and learning.
Diversity Amongst System Components (Absent) • System inputs from outside healthcare sector are virtually absent, unlike in New York City where social care elements such as housing and refugee services are incorporated.	*NPM efficiency drives* reduced system slack and redundancy, with no space to add diverse inputs (as would have occurred if Control Board had been implemented), thereby reducing diversity and its potential creation of more viable options for responding to environmental change. Further supported by NPM-driven need to control.

FIGURE 32: INTERACTIONS BETWEEN COMPLEXITY THEORY AND NPM CONCEPTS

So it is argued here that NPM's extensive influence prevents potentially beneficial complexity theory precepts from being expressed within London's TB control system, thereby impeding the organisational response to the disease (Trenholm & Ferlie 2012). The remainder of this chapter will theorise this claim, with a view to identifying relevant mechanisms.

Understanding NPM Embeddedness in London's TB Control System

Applying Instituitionalist Theory to the Analysis

Having established the presence and importance of NPM embeddedness in the observed organisational response to TB control in London, this section now further theorises this phenomenon, searching for potential explanatory causes, or the mechanisms underlying this embeddedness. The instituitionalist perspective, or archetype theory, is introduced to support this analysis.

A useful definition of institutions is found in Dacin et al (2002:52), quoting Bellah et al (1991):

> *Institutions are patterns of social activity that give shape to collective and individual experience...Institutions form individuals by making possible or impossible certain ways of behaving and relating to others.*

Following on from this, the authors suggest (p.52) that institutionalism is "a process within organizations (which) establishes a kind of character defined by the organization's commitments to values and principles". These commitments are key to understanding organisational behaviours, and form "the basis for a kind of normative rationality that legitimates organizational choices...(and)...*may constrain organizational adaptation*" (Dacin et al 2002:52-53, quoting Oliver 1997,emphasis added).

Institutionalism has developed as a major theoretical perspective within the broad discipline of organisational studies over the last twenty or so years. Institutionalism has a distinctive perspective on patterns of organisational stability and of organisational change, with a keen interest in field level dynamics as well as the behaviour of particular organisations. The literature is vast, but for the purposes of this discussion Hinings & Greenwood's (1988) and Greenwood & Hinings' (1993, 1996) versions of the framework will be used as they develop an interesting theory of organisational stability/change and have also worked empirically within UK public service settings (local government).

Institutionalism is often associated with explaining similarity and stability within populations of organisations, and not with studying organisational change. But intuitionalism also explains why organisations become static and perhaps non-adaptive, as well as why some organisations undergo radical change, or not, as the case may be (Greenwood & Hinings 1996).

Organisational archetypes, defined as "compositions of structures and systems given coherence or orientation by an underlying set of ideas, values and beliefs" have the potential to explain organizational change (Hinings & Greenwood 1988:4). Structures are seen as "the patterning of relationships, differentiation of tasks and positions, formulation of rules and procedures and prescriptions of authority" (p.8). Systems connect an organisation's structures and include processes for resource allocation, various human resources functions (appraisal, compensation) and "information and control processes" (p.10). But it is the combination of "ideas, values and beliefs", or norms, which underlies Hinings & Greenwood's version of institutionalism. Once these organisational norms become embedded, organisations often become resistant to change (Greenwood & Hinings 1996), a claim with significant relevance for this research. Applying this approach to the study of organisational changes in UK public services, Ferlie & FitzGerald (2002) note that of the three components – structures, systems and "ideas, values and beliefs", it this third which is most difficult to change within an organisation, and perhaps of most importance when initiating change.

Archetypal Change in Organisations

Since organisations tend toward inertia, archetype switches are not frequent, and attempts at inducing them are not always successful (Greenwood & Hinings 1996). The authors refer to unsuccessful attempts at switching to a new archetype as "discontinued excursions" and successful switches as "reorientations" (Hinings & Greenwood 1988:159,138). A third alternative is that organisations remain in an inertial state (p.119). The implication is that organisational fields may display long periods of stability, punctuated by the occasional radical archetype shift.[32] Interestingly, as with complexity theory, "organizational starting point and history are important in understanding the subsequent organizational processes", and in understanding why shifts between organisational archetypes succeed or fail (Hinings & Greenwood 1988:159).

[32] The authors also note that radical, quantum change is often facilitated by incremental change (p.157)

"Discontinued excursions" can arise from a number of organisational features (Hinings & Greenwood 1988:160-161):

- weak commitment to organisational change;
- limited organisational capability or capacity to change, perhaps including high workforce turnover; and,
- an absence of "transformational leadership".

If excursions into archetype change are not to become discontinued, there must be "some kind of articulated alternative organizational form" to the status quo, and the above-cited transformational leadership must not use its power and influence to confirm the validity of the existing (status quo) archetype (Hinings & Greenwood 1988:177). This point is notable with regard to the ability of London's TB control system to undergo archetype change.

Organisations in which "reorientations" or organisational archetype change is precipitated and enabled also feature some commonalities (Hinings and Greenwood 1988:139-143). These include a "strong value commitment to change" (p.141), the presence of transformational, as opposed to transactional, leadership (pp.59-60) and "transformational organisational capacity", such as a well developed corporate planning function (p.141) which are essential if organisational structures and systems are to be changed (p.156). Perhaps surprisingly, there may or may not be institutional pressure for change arising from an organisation's "task situation" (p.140), i.e., the work which must be done. Of these factors, the authors stress that "strategic commitment to particular interpretive schemes" (p.156), or the organisational "values, commitments and beliefs", are paramount.

Inertial organisations are described by Hinings & Greenwood (1988:119-121) with some caution, as their research revealed that even those organisations appearing to be in equilibrium often spent "considerable periods of time" in states of relative instability, or incompatibility between internal organisational characteristics and external pressures. Generally, however, organisations characterised by a state of inertia have "congruence" between their structure, systems and values. However, once "incompatibilities" between any of these three components arise, "tensions and pressures that will destabilize organizational practices and precipitate change" might result (p.134).

The NPM Archetype in the UK Healthcare Sector

NPM has been theorised as an organisational archetype within the UK healthcare sector, and its displacement of the long-standing public administration model in the 1980s is seen as epitomising a (rare) archetype change (Ferlie & FitzGerald 2002), underpinned by a coherent ideological challenge. In the language of Hinings and Greenwood (1988), an archetype "reorientation" occurred. Ferlie & FitzGerald (2002) further contend that NPM principles continue to define the sector's structure, systems and norms, speculating, correctly, that New Labour's attempts to move to a network governance reform narrative would be too partial and non-ideological to shift away from the embedded NPM archetype.

This research supports Ferlie & FitzGerald's(2002) contention, observing that this embedded NPM archetype continues in the NHS extending to the particular case of London's TB control system, albeit in a modified form. This observed variation between the broader NHS and the more micro level TB control system will now be analysed using Hinings & Greenwood's (1988) structures, systems and values/norms typology.

Structures

In institutional theory terms, "structures" determine the nature of relationships, tasks, rules and procedures, and establish authority (Hinings & Greenwood 1988:8). As discussed in Chapter Four, quasi-markets are arguably the defining feature of NPM and its major "structure" in archetype theory terms. Despite the introduction to the system of some minor relational elements in the late 1990s by the Blair government (Allen 2009), the internal market persists within the NHS. This was observed less consistently within London's TB control system; although the single most important group within the London TB control system - the TB *Commissioning* Board - would not have been created in the absence of a strong quasi-market culture. Managerialism is another important NPM "structure" within the NHS and more consistently noted in both the broader NHS and the TB control sub-system. But as with the quasi-market, there were differences in the "systems" which accompany managerialism within the TB control subsystem and the broader NHS. Another important NPM structure - the creation of stand-alone, arms-length agencies, a.k.a. agencification - was strongly evident within London's TB control system in the form of the HPA, a key organisation in TB control. However, its power was stilted by its independent advisory role and lack of authority, save moral authority, as discussed in Case Study Three.

Systems

Systems are the processes which make structures work, and include such things as procedures for resource allocation and human resource management, along with "information and control processes" (Hinings & Greenwood 1988:10). At this level the variation between the more macro-level healthcare system and the micro-level TB control system can be seen most clearly.

Commissioning and Contracting

As noted, the contracting function between purchasers and providers is weak within the TB control system (aside from the contractual arrangements with F&T); but not at a macro-NHS level. Nonetheless, this research observed a great deal of time at TB Commissioning Board and Clinical Working Group meetings given over to discussing TB "Commissioning Intentions", suggested features for PCTs to include when negotiating with acute trusts. It is unclear whether the resulting "Commissioning Intentions" document was used outside of the North Central London sector, which commissions TB services jointly for five boroughs, as discussed in Case Study Four. As previously noted (Laycock et al 2009:38), only 29% of PCTs reported having Service Level Agreements in place for TB services, so the application of the Commissioning Intentions is likely to be limited. Nonetheless, members of these two groups, both managers and healthcare professionals, were engaged with the process of developing the "intentions document", even though many of them clearly knew it would find limited use by commissioners in their geographic sector.

Target Setting, Performance Measurement and other Modes of Control

Similarly, there are no performance management or officially sanctioned NHS targets within London's TB control system (just a collection of looser "metrics")[33], although measurement and control systems are widely used within the broader NHS. Nonetheless, this research observed significant time spent discussing the specifics of these "metrics", with attempts at revising and updating them, and the Model of Care document does call for enhanced performance measurement, as mentioned. This was partly in response to noted significant limitations in their effectiveness and adoption

[33] For a short period, circa 2000-2002, the London Regional Office (LRO) of Public Health did set five fairly "soft" targets for TB control: (1)100% monitoring of TB treatment outcomes and treatment completion rates of at least 90%; (2)One TB nurse per 40 TB notifications in each sector; (3)Each sector to have a TB network; (4)All TB patients to be offered an HIV test; and (5)All clinics to link to London TB Register (Ohkado et al 2005). Respondents reported that these targets were abandoned with the departure from the LRO of a senior manager who held a particular interest in TB.

(London TB Service Review and Health Needs Assessment 2010, Health Protection Agency 2011[a]).

The London TB Service Review and Health Needs Assessment (2010) (the "PHAST report") noted:

> *There is no systematic reporting of metrics performance across the whole of London" (p.141)…"(c)urrent arrangements for the nine London TB metrics are ad hoc. Some of the metrics have no utility; others have not been systematically monitored. Two of them cannot currently be measured." (p.160)*

This latter point echoes that made by the HPA (Health Protection Agency 2011[a]).The PHAST report (2010:138) also observed, "(a)ll PCTs in London are now required to report to NHS London on just one of these metrics: their local rate of TB Treatment Completion." However, the NHS does not seem to do anything with the data, and TB treatment completion rates likely remain below the 85% target suggested in 2004 by England's Chief Medical Officer. This is consistent with the informal status of the metrics which do not form part of the "official" London targets. As with the discussions surrounding the "commissioning intentions", healthcare professionals and managers appeared so inured to the importance of goals and performance measures that they were willing to give up their very scarce time to facilitate the use of such goals, even when they knew the "targets" were neither well-designed nor centrally monitored.

Norms, "Interpretive Schemes", or, "Values, Ideas, and Beliefs" (Hinings & Greenwood 1988:4,12-19)

Hinings and Greenwood (1988:19) note that interpretive schemes inform actors' views in three areas: "the appropriate domain of operations" (purpose, mission); "the appropriate principles of organizing"; and, "the criteria of evaluation to be used within the organization for assessment of organizational performance". In other words, almost all aspects of organisational life are impacted by the values, ideas and beliefs of the members of the organisational system. Dacin et al (2002:52-53) remark that values

> *become the basis for a kind of normative rationality…that legitimates organizational choices in reference to an organization's mission and values and sustains organizational integrity, defined as fidelity to self-defined values and principles.*

Crucially to this discussion, the authors further note that these norms "may constrain organizational adaption" (p.53). These norms are "the crucial ingredient" which allow "systems and structures to 'hang together' to form a coherent design" (Hinings and

Greenwood 1988:13). Further, "(o)ne of the crucial attributes of values is that they become taken for granted and can serve to mute or temper expressions of dissatisfaction", a key point to this discussion (Greenwood & Hinings 1996:1036).

During a number of informal discussions and during some interviews managers working within London's TB control system could not conceive of a system without an internal market, contracts and targets. When prompted, they were consistently unable to imagine another mode of TB service delivery. The following exchange with a veteran commissioning expert (no longer working in TB) illustrates:

> *Respondent(R): I'll be honest, I'm so used to it. It's sort of the way I've come up through the NHS – "them and us" - whichever side of the coin you're on - that you get used to it. And I quite like accountability. When I started, I started doing some work on research funding. And no one had any records of where the research funding was coming and going and I remember walking around hospitals taking files out of people's offices. "You can't have it." "Oh yes I can." And that lack of discipline is quite scary in the public sector. So I quite welcome that, but I suppose that...every service? You are probably right it doesn't. But I can't think of a service that doesn't fit? Can you?*
>
> *ST: well, I mean TB is obviously the one that is coming to mind. For me, for something like a hernia operation, cataracts, something like that that are quite clean cut, you're in, you're out...The patient - you're not quite so concerned about all these psycho-socio factors that go along with TB patients.*
>
> *R: The PCTs are. And they are the ones responsible for that.*
>
> *ST: Right...*
>
> *R: "How would you commission it?", is the counter question and I'm not sure what system would work...It's the only way we've got.*

Another example of the extent to which NPM-inspired systems have become the taken-for-granted norm was found in the almost unchallenged move by NHS management to set aside the Control Board concept. Despite TB Commissioning Board and Clinical Working Group members being briefly exposed to and excited by an alternative, more holist, approach to organising TB services, in the end they quickly and easily reverted to what they knew and were most comfortable with. Further evidence of the extent to which an NPM-mindset exists, and continues to be influential, is reflected in the recent Model of Care. As discussed in Appendix G, this document features, distinctively amongst the 14 reports/documents which have been prepared on TB in London,

explicit and "positive" use of "NPM language", including the following stated objectives for improving TB control in London:

- *To ensure robust commissioning of TB services, including sound planning and strong performance management.*
- *To improve the quality and productivity of services.*
- *To ensure capacity of services is related to need.*
- *To exploit opportunities for cost reduction.* (NHS London 2011 [b]: 22)

During observed meetings, healthcare professionals, including consultants, rarely, if ever, challenged NHS management when they would say a particular option could not be pursued because it would require extra funding. This was particularly evident during the development of the Model of Care and Case for Change policy documents (although in the end, the agreed policy did require an additional investment of £2 million to be shared across the 31 PCTs, an amount described by an NHS manager as equivalent to "a rounding error" for a PCT). It is widely agreed that TB control in London has been, and continues to be, chronically underfunded despite increasing demands on services. Yet the NPM commitment to driving efficiency appears to be deeply ingrained, even amongst staunch public health advocates, and NHS managers face little challenge in their ongoing focus on cost containment in the face of rising TB rates. The New York City approach, in which a significant financial investment was made in the early days of the epidemic and is seen as pivotal in stemming the spread of the disease, is dismissed in London as simply impossible.

These examples speak to the extent to which the norms, or values, of members of London's TB community would have to be changed if NPM is to be usurped by another archetype. Those working within London's TB control system clearly, and understandably, feel obligated (knowingly or not) to uphold NPM's underlying principles and play by its rules. The organisational archetype of the broader system within which most system actors work (the NHS) is New Public Management and there is little reason to expect a small subsystem like London's TB control system to operate with a different archetype. For the vast majority, it is the only system they have ever known; or, in the words of the respondent quoted above, "It's the only way we've got."

Nonetheless, it could be argued that there is a "disconnect" between the TB control system's NPM archetype and some elements of its structures, systems and values/interpretive scheme. For instance, contrary to what would be expected from NPM, London's TB control system is not subject to any top-down pressure for reform,

although this is sorely needed. Neither is it subject to centrally mandated targets or performance measures. And further, most research respondents clearly espoused public health values, which are contrary to much of what NPM represents. According to Hinings & Greenwood (1988:34), this sort of misalignment should indicate vulnerability to archetype change. Further, Greenwood & Hinings (1993, 1996) note that competing commitments to archetypes, i.e., the observed commitment to both the NPM and public health archetypes, means further potential to "destabilize organizational arrangements" (1993:1075).

So is there any evidence of a shift away from embedded NPM values in this study? There are two ways of assessing this question. In an active sense, it could imply the articulation of a post-NPM ideology: there was little evidence of this. In a passive sense, it could be the case that respondents had come to perceive of NPM as impossible to dislodge and that any other alternative was literally unthinkable. It was for this latter option, the passive embedding of the NPM archetype, for which evidence was found, as cited above.

Further, and as discussed above, archetype change, or "reorientation" requires transformational leadership (Hinings and Greenwood 1988:59-60) and/or ideologically motivated change agents (Ferlie & FitzGerald 2002). There was no evidence of the presence of such change agents or leadership within the TB control system. Indeed, as discussed earlier there is little evidence of leadership at all within the system. Consequently, it is highly unlikely that NPM will be replaced as the dominant organisational archetype, leaving the system struggling with the previously noted challenges this brings.

The purpose of the foregoing discussion was to use archetype theory/institutionalism to theorise NPM embeddedness within London's TB control system. As noted at the start of this chapter, and earlier on in the thesis, this embeddedness exacts a significant cost in terms of the organisational response to TB control. Specifically, NPM impedes or negatively impacts the expression of some of the potentially useful aspects of complexity theory observed within the system (especially self-organisation, co-adaptation and the presence of diversity), and is generally unhelpful to a public health approach. Archetype theory, as applied above, has allowed for a deeper understanding and explanation for the reasons of this embeddedness.

The remainder of the chapter provides an explanation, using a theoretical elaboration based on Kingdon's public policy agenda setting theory, for the lack of public policy attention given to TB control in London.

Theorising TB's Low Public Policy Ranking Using Kingdon's (1995) Theory of Agenda Setting

This section theorises the key inductive finding of the research (the low policy priority accorded to TB control in London) by drawing on the literature reviewed in Chapters Three and Four, as well as on the empirical data presented in Chapters Six and Seven. As the issue emerged inductively, a full theoretical examination requires the use of an additional conceptual framework; namely, Kingdon's (1995) theory on public policy agenda setting. The theoretical analysis of this existing model will be supplemented by (re)introducing elements of complexity theory into the discussion.

A Brief Review of Kingdon's (1995) Theory of Public Policy Development

As discussed in Chapter Four, this theory argues that three separate streams – problems, policies and politics – must develop independently of each other and then join together if public policy is to be changed. Problems are conceptualised as conditions which are in need of addressing. "Conditions" may become "problems" when routine monitoring detects a change. Policies, according to Kingdon, are formulated in a Darwinian-like process in which numerous ideas and alternatives are developed and discussed by a policy community, with only the strongest and most viable surviving. The policy alternative which ultimately emerges from this process is usually technical feasible, provides decent value and is acceptable to both politicians and the public. Kingdon's politics stream is comprised of politicians and their staffs who, in turn, set the general political climate of the day. These prevailing political winds largely determine whether the time is right for a particular policy idea to be pursued. However, since change is a constant feature of the political landscape, Kingdon observes that for most ideas, their time will eventually come.

Theorising the Situation via Kingdon's Three Streams

With respect to TB control in London, only one of the three streams has been successfully developed – the formation of an agreed policy alternative - and that has occurred only within the past year.[34] The London TB community was acutely aware of the need for such a policy. Numerous respondents recounted an anecdote about a very

[34] "The Case for Change" and "Model of Care" documents, cited earlier, comprise this plan.

senior NHS leader in London declaring that until there was a solid, widely agreed plan of action for TB, it would be difficult to secure support and resources for TB control. The response by the TB community was slow in coming (it took at least 4 years from the call for such a plan until it was produced), but the advice was taken and acted upon. Producing the policy plan was not a seamless exercise, and the end product reflects various compromises largely arising from cost containment pressures within the NHS and related, ongoing restructuring initiatives. (The major concession by most members of the TB Commissioning Board and the TB Clinical Working Group was accepting the demise of the TB Control Board concept in favour of an enhanced Commissioning Board, as discussed in Case Study One.)

TB in London is not a Problem?

However, Kingdon's other two streams – problem recognition and political will to affect change – are absent in London's TB control system. Although Kingdon contends that the three streams develop independently of each other, "problem recognition" and "political will" appear more closely related to each other in this study than either is to the policy formation stream. The successful development of the policy document, in the absence of problem recognition and political will, reflects this observation. However, Kingdon's model would predict that until the need for improved TB control in London is recognised as a *problem* by the appropriate senior-level NHS and DH officials, and *political* support to tackle the issue is forthcoming, the policy plan will languish.

Empirically, Kingdon's argument is fully supported by this research. Readers may recall the situation discussed in Case Study One, whereby the policy plan, once written, repeatedly encountered dead ends and brick walls when TB Commissioning Board representatives tried to move it through the byzantine NHS approvals process. At the time of writing, the completed plan was largely in disuse. Ongoing NHS restructuring and cost cutting make its eventual implementation even less likely, at least in the short to medium term, while providing "cover" to senior levels of the healthcare system which continue to de-prioritise the issue[35].

Kingdon argues that conditions become problems when key indicators reveal a change in a situation, or in a crisis. By the first measure, TB in London should now qualify as a problem. Crucially, however, the *category* into which a condition has been placed is also important, since category placement "structures people's perceptions of the problem"

[35] Of course, this could all change quickly in the event of a significant TB outbreak or drug-resistant TB infecting someone in "mainstream" London society, as happened in New York City

(Kingdon 1995:111). This perhaps unlocks a key reason why, rather wondrously, resurgent TB in a densely populated metropolis is not recognised as "a problem".

The preceding analysis describes TB as having fallen victim to a problematic categorisation, consistent with Kingdon's argument that "conditions" need to be properly categorised to become recognised as "problems". Within the NHS, including within its public health function, TB control is categorised as a relatively minor problem and lack of organisational support is justified on this basis. The issue of communicability and the danger of drug resistant disease "jumping the fence" into mainstream society is largely ignored, owing in part to concern about causing undue, potentially xenophobic, alarm amongst the general public. The result is that TB in London remains, in Kingdon's terms, a "condition" and not a "problem".

Further, there is little political mileage for elected officials in supporting TB control in London. From an organisational politics perspective, senior NHS management receives this signal and reacts as expected, concluding there is no professional benefit in pushing for improved TB control. The unwritten, yet clearly communicated, steer from NHS London to keep the TB issue "off the radar" has a powerful, silencing effect. Speculatively, it reflects senior NHS management's interpretation that their elected political masters, and hence their own careers, would be best served, if the resurgence of TB in London were to remain invisible (even if the price is a continuing high TB infection rate). It is proposed here that the Department of Health shares a similar perspective, given the continued downgrading of its operational and policy capacity with respect to TB control and its refusal to set TB targets on the grounds that the disease is not significantly widespread (information relayed by a key respondent).

Organisational Level Considerations

Whilst it is important to acknowledge the role played by race and class in TB control in London (here confirming Dievler and Pappas (1999)), this current research has been undertaken at the system and organisational levels, analysing the relationships between different components of the TB control system. Consequently, the remainder of this discussion will focus on that level.

The first section of this chapter discussed the impact on TB control of NPM embeddedness within the healthcare system, highlighting the surprising lack of targets and organisational performance measurement tools within London's TB control system. A leading public health consultant observed that "none of the Chief Executives

will be being managed on their ability to control TB". Similarly, a long-serving public health consultant commented, "I used to do quarterly reports on TB and I haven't done one in a year and nobody has rung me up and said 'where is my report on TB metrics?'. They are not bothered because they're not doing anything with that information." These comments not only reflect NPM embeddedness at a macro-level, but also the low organisational priority given to the TB issue and associated metrics.

The extensive NPM-inspired fragmentation within London's TB control system is made more problematic by weak leadership and accountability at the organisational level. This is also symptomatic of the low priority given TB on the healthcare policy agenda. In the presence of strong leadership and an ensuing chain of accountability, some respondents felt it more likely that London's need for improved TB control would be acknowledged and addressed. For example, a well-placed respondent noted the need for someone courageous within the healthcare bureaucracy to champion better TB control. If this occurred, the issue might well move up the healthcare priority list. "If we could have found a couple of people somewhere in the hierarchy bold enough to work with us on it, it would have made a difference", said the source.

There appear to be two main reasons why this has not happened. First, TB control's low status as a healthcare need in London can be conceptualised as arising from a "perfect storm" of factors which collude to keep it off the agenda: public health is seen as a lower status specialty within medicine (Abbott 1981) and TB is "a poor relation in the family of public health" (Department of Health 2004:9); within the respiratory medicine speciality TB has a lower status than other diseases such as COPD; and finally, within broad society, TB patients themselves generally occupy the lowest social strata. With this confluence of phenomena, all occurring within a fragmented and leaderless system, TB control struggles to find a place on the healthcare agenda.

Secondly, TB carries with it complex political considerations. Those working within the system are cautious about arousing the "wrong kind" of interest, leading to uninformed public hysteria. Various respondents raised concerns about igniting the tinderbox of what was sometimes termed "the Daily Mail effect". They had concerns that London's TB epidemic would be portrayed simplistically by the tabloid and right-wing media as resulting from immigration, acquiring xenophobic and racist overtones. This apprehension resulted in significant self-censorship by many working within the system; the fear expressed by respondents was sincere and undoubtedly impacted the

manner in which they believed the TB "issue" should be approached externally. One public health director observed:

> *in a way the people involved have always been quite cautious about how we present it politically because it also had the risk of feeding into a particular reactionary side of, "it's all these immigrants or asylum seekers or whichever bad group", you know?... that's been part of the balance...about not advocating too loudly because otherwise you end up stigmatising further people who are probably struggling with lots of complex conditions...*

On the other hand, these respondents, along with most others in the system, also expressed profound frustration at their inability to have TB taken seriously as an issue. This research found profound frustration amongst respondents that TB control in London is not prioritised, suffering from a lack of internal (NHS-Department of Health), "small p" political commitment.

NHS London was the most frequent target for criticism from a group of well informed, including senior-level, respondents. A former director of public health observed, "that's where I would put my finger of blame, actually, because they were probably the only single organization that could have gotten this taken seriously across London, because they do hold all the Chief Execs to account...". Another former director of public health shared a similar sentiment, observing "within NHS London, in recent years, nothing has happened. And that's a leadership failure...". Parallel observations came from a former senior PCT manager who commented, "I suppose NHS London could have filled the policy vacuum in London, but there wasn't anybody who perhaps could be bothered to take the risk". A TB consultant similarly remarked, "NHS London has been pretty supine actually, in terms of getting tuberculosis care sorted out".

Complexity Theory: Self-Organisation and the Importance of Initial Conditions and System Historicity

TB's low-priority status as a health policy issue is theorised in this chapter by combining Kingdon's framework with elements of complexity theory, as he himself suggests; specifically, concepts of self-organisation and initial conditions and historicity. This section recaps relevant aspects of these complexity theory concepts.

Self-organisation forms the backbone of complexity theory. Many authors, particularly those writing for general management and lay audiences, portray self-organisation as a

generally positive phenomenon and something which organisations should foster (Axelrod & Cohen 2000, Pascale et al 2000). Whilst this is often the case – self-organisation is the source, after all, for novelty and innovation – not all self-organising behaviours are beneficial. It is useful to recall the definition offered by Boons et al (2009:234-235): "self-organisation is the ability of actors and organizations as well as larger systems to maintain or change their structure and strategy by themselves, without external control, and to resist externally induced change". Some self-organising behaviours can be maladaptive (McKelvey 2003), perpetuating the status quo when change is needed and promoting self-interest above organisational effectiveness (Boons et al 2009). So self-organisation can be a source of stability – or inertia – in organisations (Stacey 1996:204). According to the most conservative conception of self-organisation, an absence of any intent by actors (i.e., to achieve a particular objective) is a key feature of self-organising systems (Paley 2011).

History informs the initial conditions found within a system which, in turn, affect that system's current and future behaviours and outputs. Of particular importance here is a point noted in Chapter Three: a system's history "shapes individual and organizational schema (mental models, or 'worldview') and schema in turn constrain what is seen and not seen, what is important and what is not" (Zimmerman & Dooley 2002:70). In other words, actors within a system partly determine the system's future based on how they see its past.

Having reviewed the main tenets of Kingdon's theory earlier in this section and re-capped pertinent elements of complexity theory here, the chapter now applies the two theories to examine why TB control in London occupies such a lowly place on the health policy agenda. As discussed earlier, this present research now builds on Kingdon's own observations regarding the congruence between his theory and complexity theory, leading to a theoretical contribution to the political science literature on policy making. It is proposed here that the two theories are more than analogues; in fact, complexity theory can enhance the explanatory power of Kingdon's model as he himself hinted. Two illustrations follow.

The Role of Self-Organisation in Developing Kingdon's Problem Recognition and Political Response Streams

The inability of the London TB community to have TB recognised as a "problem" and to gain political commitment for change - two of the three necessary streams identified by Kingdon - can be usefully understood as arising from maladaptive self-organising

behaviours. This additive theoretical analysis helps explain the seemingly illogical situation in London today whereby political support for combating surging levels of a serious, airborne, communicable disease is lacking.

As discussed earlier, the most conservative definitions of self-organisation stress the lack of intention amongst actors in self-organising systems in working toward a specific outcome (Paley 2011). As in all self-organising systems, participants act according to local knowledge, have no identified leader and are unaware of how their actions contribute to a particular outcome. It is argued here that this conservative type of self-organisation explains how two of Kingdon's three streams (problem recognition and political commitment) have not been developed with regard to TB control in London.

Members of the TB Commissioning Board have each decided, for individual reasons, to comply with NHS London's wish that TB be kept "off the radar", and have kept quiet about the issue. It is not suggested here that this represents in any way a deliberate or organised conspiracy of silence. Rather, it appears that members individually surveyed the professional and organisational landscape in which they work (i.e. attained local knowledge, in the language of self-organisation), and have concluded that acquiescence and quiet are the best approaches (e.g., above quotation: "So in a way, there was no point in trying to push it", and the previously cited behind-closed-doors musings from a nurse regarding what would happen if someone in mainstream society contracted MDRTB, whilst everyone in the meeting room had been aware, for years, of this risk without doing enough to prevent it happening.). For some Commissioning Board members, particularly consultants (professionally powerful and independent), or those not employed by the NHS, the motivation may stem largely from concern about igniting a racism-fuelled public backlash regarding immigration, or a genuine belief that no one "out there" cares enough about TB to listen to their concerns. The sole TB advocate organisation with a primary domestic focus, TB Alert, is also concerned about creating a public backlash. Also, they work with significant resource constraints and focus their efforts on TB-affected communities and on awareness-raising amongst health and social care professionals. For others, particularly senior NHS managers, there are significant professional considerations associated with drawing attention to TB control. Self-organisation as described by Boons et al (2009:235) "stems from the free choices of people in charge often oriented at maintaining their position and stability…and…often will be driven by the ambition or need to survive (often this is called self-interest)".

It is posited here that these negative, or maladaptive forms of self-organisation (McKelvey 2003), are behind both TB's low priority standing as a public health issue, and its inability to be recognised as a problem and to gain political commitment. These self-organising behaviours fuel the creation, and maintenance, of a TB policy vacuum in which policy champions, whistle blowers and activist groups are notably absent. Just as Stacey (2003[b:],333) observes, "(o)utcomes are co-created by all agents within a system. Everything everyone does, including doing nothing, might have an impact."

The Importance of Initial Conditions and Historicity in Developing Kingdon's Problem Recognition and Political Response Streams

This section examines Kingdon's observation that initial conditions and historicity are important to both his own theory and complexity theory. It reinforces and develops the observation by briefly contrasting system history and initial conditions impacting the public policy response to TB control in London with the response to HIV/AIDS. As external context is important when discussing history and initial conditions (Rhodes et al 2011), the changing nature of the macro environment (the NHS system as a whole) is also analysed.

As noted in Chapter Three, a system's history determines its initial conditions, although Rhodes and McKechnie (2003) contend that it is difficult in a public management context to identify clearly a system's initial conditions. However, for the purposes of this discussion, the initial conditions in London's TB control system will be taken as those occurring during the earliest years of the return to rising TB rates, 1988 to 1992.[36] For the HIV/AIDS discussion, the years 1981-1986 will be used (the first HIV case in the UK was formally diagnosed in 1981) (Health Protection Agency 2011[e]:4). These periods represent founding conditions for the two epidemics as health policy issues.

Just as maladaptive self-organising behaviours prevent TB becoming recognised as a problem meriting a political response, so the history and initial conditions present within the system when rates started to increase also have an impact. For instance, TB physicians (many trained as chest physicians) were, and are, a lower status, lower power, speciality:

> *…the status of people in tuberculosis, and in respiratory medicine, tended to be lower than in some specialities. Most of the people running the chest clinics*

[36] The rise in TB rates started in 1988. 1992 was the year the first "working group" of experts came together to examine this phenomenon.

> *were…doctors who had themselves had tuberculosis. So most old-style chest doctors had had TB and they had then not been able to pursue "a proper" career, and were running the chest clinics.* (Senior TB physician)

This history has been internalised and passed down within the TB community over the decades, leading to self-identification among those working in London's TB services as working in a "Cinderella" or low-power speciality. This makes it easier for the NHS to ignore the disease, leaving it as a "condition" and not as a "problem", in Kingdon's terms. The lack of patient activism and voluntary groups promoting TB patients' interests (unlike the HIV/AIDS policy arena) were further contributors.

Further, the epidemiology of TB's return to London meant the disease's rate of growth was slow (but relentless, as it turns out), with several implications. As discussed, it took years before the medical community in London reacted to the rise in TB rates, and then the response was tentative and focused on improving surveillance (McEvoy & Maguire 1995, Pearson 1996, Department of Health 1996). Presumably this would have been different if the (eventual) resurgence had signs of rapid spread (as with HIV/AIDS and SARS). Similarly, the perceived risk to mainstream society was (and still is) low. Consequently, TB's epidemiological nature stymied its early recognition as a "problem", impeded the development of an agreed "policy" alternative for tackling the disease, and dampened "political" inclination to respond. These founding conditions would prove fateful in determining the manner in which the epidemic was addressed, both organisationally and politically.

From the situation described above a useful contrast can be found in the organisational response to the arrival in London of HIV/AIDS. During the early years of TB's return to London (1987-1993), the number of TB cases rose by 34%, from 1445 to 1941 (McEvoy & Maguire 1995). During 1981-1985 (inclusive), the analogous period defining "initial conditions" for HIV, the number of cases in London increased from 0-1468 (Health Protection Agency 2012 [g]). So the rate of HIV infections grew at a more alarming pace than with TB. (However, only in 2003 and 2004 were there more new HIV cases in London than new TB cases, and then, just barely[37].) The physicians treating both diseases work within lower status specialties: genitourinary medicine (GUM) and infectious diseases for HIV (Bennett & Ferlie 1994:37-39), and respiratory

[37] Number of new HIV cases in 2003 and 2004, respectively: 3259, 3270 (Health Protection Agency 2012[e]). Number of new TB cases during these same years: 3075, 3127 respectively. From 2005 onward the annual number of new HIV cases started to decline (to 2,673 in 2011) whilst the number of new TB cases has continued to increase (with 3588 new cases in 2011).(Health Protection Agency 2012 [a,f]).

medicine, infectious diseases or public health for TB. However, this obstacle was overcome by HIV/AIDS physicians by leveraging their positions at key, influential teaching hospitals combined with effective "boundary spanning" activities into local health authorities and the voluntary sector (Bennett & Ferlie 1994:81-83,127). Further, HIV/AIDS quickly established a formidable and effective presence in the voluntary sector, and patients were able to shed the stigma associated with the disease and become powerful advocates in their own right. (Bennett & Ferlie 1994:22,48-50). Meanwhile, the issue of stigmatisation remains for TB patients. Healthcare professionals widely regard this as a hindrance to both patient activism, of the type associated with HIV, and with actually diagnosing and treating the disease. Figure 33 below summarises these relevant organisational and environmental factors.

	TB (1988-1992)	HIV/AIDS (1981-1986)
Status of Medical Professionals	Low	Low
Role of Voluntary Organisations	Absent	Active
Patient Voice / Activism	None	Significant
Nature of Epidemic	Slow growing	Rapidly growing
Perceived Risk to General Public	Low	High

FIGURE 33: SUMMARY OF "INITIAL CONDITIONS" CHARACTERISING LONDON'S TB AND HIV/AIDS EPIDEMICS (BENNETT & FERLIE 1994, FOR HIV/AIDS DATA)

The Changing NHS Macro System

As the conditions within a system's macro climate form an important consideration when analysing initial conditions and historicity (Marion & Bacon 1999), below is a short discussion regarding the differences between the NHS macro systems during the early days of the HIV/AIDS epidemic in London and during the return of the TB epidemic.

The period between 1981-1986, when the HIV/AIDS epidemic took hold in London, found the NHS in the very earliest stages of NPM reforms, and most NPM features had not yet become embedded. The introduction of general managers following the 1983 Griffiths Report (Griffiths 1983), seen as the first step in the NPM reform project, was in its very earliest stages of implementation during this time (Ham 2004:32-34). It was not until 1985 that these first managers were in post, reflecting Klein's (2010:119)

observation that "(t)he conversion of NHS administrators...into active managers was slow". And unlike the NPM reforms which were to come later, this shift to general management arguably helped strengthen vertical hierarchies, facilitating the rapid policy response to HIV/AIDS. During the early days of the epidemic in London, the NHS had not yet been subjected to the fragmenting internal market reforms which were soon to come and prove so problematic for effective TB control.

Following the 1989 government White Paper, *Working for Patients,* quasi-market reforms were introduced to the NHS, circa 1991 (Ham 2004:37-38). Klein (2010:105) characterises the period between the White Paper and the Griffiths' Report as one in which government focus moved from the organisational structure of the NHS to a preoccupation with organisational dynamics. As discussed in Chapter Four, this introduction of market principles into the NHS resulted in significant fragmentation arising from the purchaser-provider split, contracting and commissioning; outsourcing to non-state providers and also a shift to agencification. However, by this time, the aggressive policy response to the HIV/AIDS epidemic was well entrenched. But not so with TB, the modern-day treatment of which would be subject to the "invisible hand" of the new NHS internal market. Although TB rates started climbing again in 1988, by the time the (re)emergence of the disease was recognised in the mid to late 1990s, the most radical and far-reaching of the NPM reforms - the internal market - had taken hold, and fragmentation within the NHS was well underway. These changes were compounded by the introduction of the agencification program, set in motion by the Ibbs Report, The Next Steps Initiative (National Audit Office 1989), and enacted from the early 1990s onward. The stated objective of the report was to enhance public service efficiency and taxpayer value "by operating departmental services and functions as Executive Agencies established within a framework of policy and resources set by the responsible Minister" (p.1), e.g., the HPA. And as discussed, system fragmentation has become, perhaps, the most serious obstacle to establishing a successful TB control program in London. It was under these "initial conditions" that the TB community tried to gain recognition, political support and a place on the policy agenda. System fragmentation proved to be an instrumental condition.

Concluding Remarks

This chapter has theorised two empirical phenomena: the relationship between the complexity theory concepts and the NPM concepts as observed, and the surprisingly low policy priority accorded to TB control in London.

NPM has been shown to be deeply embedded within London's TB control system, suppressing, or otherwise negatively impacting, potentially beneficial complexity theory concepts such as self-organisation, diversity and co-adaptation. This finding constitutes the major theoretical contribution from this chapter.

Further theorising and developing this contribution, and returning to the research questions identified at the start of this chapter, the discussion then focused on discovering the mechanisms underlying the relationship between the observed complexity theory concepts and the strong presence of NPM. This task was facilitated by applying the instituitionalist, or organisational archetype perspective, as advocated by Hinings & Greenwood (1988) and Greenwood & Hinings (1993, 1996). This research also developed and validated Ferlie & FitzGerald's (2002) contention that NPM remains an organisational archetype within the UK healthcare sector, despite some indications following the election of the Labour government in 1997 that it may be dislodged. The key mechanism identified as most probably responsible for the continued strong presence of NPM and the leading constraint to archetype change are the "ideas, values and beliefs", or the "interpretive schemes" of those working within London's TB control system. The structures and systems associated with the organisation of TB control in London are underpinned by a set of values which support and promote NPM principles, perhaps uncritically and almost certainly tacitly and not actively. Despite decrying the lack of a holistic, public health approach to TB control, at least some of which has been shown to be associated with the presence of NPM, actors working within the London TB control system were observed promoting and conforming to key NPM concepts. Of note, these behaviours occurred in the absence of any interest or monitoring from senior management in "the centre". Actors in the system, in effect, self-regulated in an almost Foucauldian manner to support the embedded NPM archetype.[38] An additional identified mechanism is the lack of transformational leadership within the system, a necessary ingredient in any archetype "reorientation".

The chapter also discussed a major finding which emerged inductively from this research – the low organisational and political priority accorded to TB control in London and the serious consequences flowing from this status. This finding has been theorised according to Kingdon's (1995) model of public policy development, which was found to offer a strong explanatory framework. Tuberculosis in London is not

[38] This might also be seen as another instance of negative self-organisation which perpetuates the status quo.

recognised as a "problem", in Kingdon's sense of the word, by senior NHS London officials, Department of Health officials, or elected representatives. Neither has the issue been afforded any political support. Despite an agreed policy alternative finally being developed, it is not sufficient to have just one stream in place if an issue is to move up the public policy agenda. As TB is not seen as a "problem" and there is no political will to address it, TB infection rates in London, including drug resistant infection rates, continue to climb - as forecast by Kingdon's model.

Although Kingdon's framework proved useful, its application begged the question as to how this peculiar situation could arise, i.e., what are the mechanisms which resulted in this situation? Complexity theory was re-introduced, following Kingdon's own brief musings concerning potential synergies between his model and complexity theory. This additional theoretical analysis revealed that a maladaptive form of self-organisation, in which actors within the TB control system self-censor and stay quiet about the severity of the TB problem in London, prevents the development of active championing leadership which allows the issue to be recognised as a problem and develop vital political support. This self-censorship arises from either self-interest and/or concerns amongst members of the TB community about causing a xenophobic backlash against migrants. Further, system historicity, initial conditions and the mental models at play (both at individual and organisational levels) were identified via complexity theory as additional mechanisms leading to TB's on-going status as "low priority" and contributing to preventing the development of Kingdon's three streams. These aspects came together to produce an entrenched characterisation of TB as a "small" disease, making it easier for policy makers, both elected and at senior levels of the NHS and the DH, to ignore. Finally, comparisons were drawn between the impact of initial conditions and historicity on the organisational response to HIV/AIDS versus TB, as well as the impact of the differing macro political environments with which each of the diseases initially contended. On balance, HIV/AIDS faced fewer obstacles in its early days in terms of developing Kingdon's three streams, facilitating a vigorous and effective policy response.

This chapter provided two theoretical interpretations of the empirical chapters. The next, concluding, chapter reviews key research findings, the research gaps which have been addressed, and reflects on the journey of producing this thesis.

CHAPTER NINE: CONCLUSION

This thesis has analysed the organisational response to resurgent tuberculosis across London, attempting to explain and understand why one of the world's most modern metropolises has been battling, with limited success, this ancient and confounding disease. Dubos and Dubos (1953:vii-viii) remarked that tuberculosis "modifies in a peculiar manner the emotional and intellectual climate of the societies that it attacks...It is the consequence of gross defects in social organization, and of errors in individual behavior." This research has identified some of these "defects in social organization" and the mechanisms responsible, and has analysed the role played by the wider political economy of which the "social organization" is a part.

This concluding chapter opens with a reflection on the methodological approach adopted in this study. This will be followed by a review of the empirical and theoretical contributions of this research, along with suggestions for further research. The chapter then concludes with some personal reflections and observations on the thesis.

Methodological Considerations and Reflections

This thesis has a distinctive subject of study (the organisational response of the system responsible for TB control in London), uses a novel theoretical framework (complexity theory) and is underpinned by a relatively new and emerging research paradigm (critical realism). It was not my objective to conduct unorthodox research, and I recognise this approach added both risk and extra challenges. There was little previous, similar research which I could call upon for guidance, which meant I needed to be flexible, yet thoughtful and careful, when designing and executing the study.

I entered the PhD program with the intention of undertaking a complexity theory-informed study within a public sector setting. From there, it was not difficult to whittle the options down to public health, and from there discussions pointed to a study of TB in London. NHS leadership within the TB control system was willing and open to accommodate my study, reflecting what I've come to see as a deep commitment on the

part of the Health Service to promoting research. With regard to the use of critical realism in this study, despite its "newness", I remain convinced of the value of the paradigm for this research. Positivist studies aim at producing predictive models and interpretivism is concerned with understanding and surfacing meaning. Critical realism, however, aims to explain causality by identifying and examining the generative mechanisms responsible, thereby making it particularly suited to this research.

The observation period for this study extended over approximately 25 months, during which time I was able to amass a considerable quantity of data. This included observing the creation of the 12th, 13th and 14th reports into TB control in London (the externally commissioned "PHAST Report" and the Case for Change and Model of Care). It was particularly helpful to watch the creation of the Case for Change and Model of Care documents, observing relationships and interactions amongst different professional groups, amongst the NHS, the DH and the HPA, between geographical sectors and between management and professionals. Like much qualitative complexity theory research, understanding relationships was vital to this study, so extensive meeting observation was a key element of this study, giving me the chance to observe these relationships in action. Attending meetings also gave me the opportunity for informal conversations with members of London's TB community, some of which yielded valuable background information and contextual detail.

Not surprisingly, interviews were an equally rich and valuable source of data and often respondents were good sources of interesting archival documentation. Documents were shared with me from a wide cross-section of the TB community and were especially helpful in augmenting my historical knowledge and appreciation of organisational aspects of the TB control system. A potential limitation in the data I collected is that I was unable to keep my name on internal email lists. This was partly a result of administrative staffing turnover at the NHS (specifically within London Health Programs which "hosts" the TB program), but likely also reflected a certain degree of caution on the part of NHS management.

My status as an independent, self-funded researcher came with both pros and cons. I came into the system with no "baggage", and members of the TB community seemed to appreciate the objectivity and freshness of perspective which I brought. At the same time, working without the official sanction of, for example, the NIHR or ESRC, meant I was completely reliant upon goodwill in terms of accessing meetings, people and documents. But, as mentioned in Chapter Five, I feel I was given tremendous access to

the system as a whole and to many of its constituent parts, with the exception of the Department of Health (for reasons unknown).

I had offered at the outset of my research to present my research findings to the TB Clinical Working Group and the TB Commissioning Board. This presentation has not happened and it is unclear as to whether it will. In early 2012, NHS management decided to significantly restrict attendance at these groups' meetings (which effectively ended my ability to observe the meetings) and they currently seem ambivalent about inviting me back to discuss my research findings.

Empirical Contributions

To the best of my knowledge, this research represents the only large-scale study, undertaken from an organisational perspective, of TB control in London. A 2005 paper comparing TB management in London with that in Osaka, Japan provided a high-level snapshot and overview of TB service delivery in London at that time, but the description was limited in scope and does not offer a critical analysis of the system (Ohkado et al 2005). As noted previously, TB in London has been well researched from a medical/epidemiological perspective (McEvoy 1995, Ormerod 1994, Neely et al 2009) and through a number of sociological lenses (Coker 1998, Story & Citron 2003, Story et al 2007, Gandy & Zumla 2002), but this thesis is uniquely focused on how TB control in London is organised at the system level.

Secondly, as noted in Chapter Three, there have been repeated calls for more empirical research within the field of complexity theory (Carapiet & Harris 2007, Chiles 2004, Houchin & MacLean 2005, Johnson and Burton 1994, Lissack 1999). This study responds to that call and offers a major empirical example of complexity theory research. By also analysing and acknowledging the role of the broader political economy within which the TB control system operates (a heavily NPM-influenced environment), this thesis also responds to the call for complexity theory research which highlights the important role played systems' macro context (Marion & Bacon 1999).

The third empirical contribution arising from this research (and as previously reported in Trenholm & Ferlie 2012) concerns how an NPM-inspired need to control by the NHS has contributed negatively to TB control in London. In the cases of both the Find & Treat team "takeover" and the mini-coup orchestrated by the NHS against the HPA's early leadership on the InR-TB file, the results, arguably, have not been positive. At a

minimum, they generated significant amounts of ill will and contributed to an "us and them" mentality. The quashing of the Control Board concept was also likely motivated in part by an NHS fear of relinquishing some of its control if Board membership were broadened. This research validated what other studies have noted, that, where maintaining control is prioritised over looser forms of organising and, indeed, creativity, it is difficult for novelty and innovation to emerge (Boons et al 2009, Kernick 2002). NHS managers were observed to be unable or unwilling to foster the type of setting conducive to innovation and learning. Boons et al (2009) suggest that public sector managers in complex systems (such as London's TB control system) should try to co-ordinate system processes and develop a fertile environment for creativity, novelty and innovation. Vitally, "(c)reating conditions, however, is different from exerting control", they note. Managers in London's TB control system were not observed as making this important distinction.

The final, but by no means least important empirical finding of this study, is that TB control in London is afforded virtually no priority or attention by senior managers within the healthcare system, despite being a communicable disease with a growing incidence of drug resistance. It is suggested that this phenomenon is the result of a form of maladaptive self-organisation by members of the London TB community, as discussed in detail in Chapter Eight.

Policy Implications

There are three policy implications flowing from the above empirical findings.

The first, and perhaps most important implication, is clear: *tuberculosis needs to be recognised by the NHS and the Department of Health as a serious public health issue and responded to as such.* Dunleavy (1995) discusses "policy disasters" in Britain which have resulted from various NPM-driven decisions and choices. Whilst TB policy in London cannot be classified as "successful", it has not precipitated the sort of crises which Dunleavy analyses (the poll tax, the London Ambulance Service IT policy changes). But the TB control program does have some characteristics of a slow burning policy disaster: an inability for the system to control overall infection rates, worrying year-on-year increases in the rate of drug resistant disease and unwillingness by senior policy makers to tackle the problem before it becomes a full-blown crisis. Securing senior level support might lead to a better resourced, more effectively organised, and more accountable TB control system and ultimately, to a reduction in TB infections. There can be little mystery surrounding what needs to be done to improve the

management and control of TB in London, in light of the 14 previously cited reports addressing this issue. The mystery is why not a single person with the power to affect change has seen fit to take action. Recalling the comment from a senior level respondent, all that is needed is for someone with some influence within the healthcare bureaucracy to show some courage by championing the issue.

The second policy implication flows from the above-noted proclivity by the NHS to try to control its environment, perhaps instinctively and uncritically. It is suggested that *NHS leaders within London's TB control system should experiment with, or at least consider, loosening their reins of control, and try to create organisational conditions more conducive to the emergence of novelty and to co-adaptation and organisational learning*.

Finally, on a more macro level, this study backhandedly reiterates and validates other research which identifies the value of networks in tackling so-called wicked problems (Ferlie et al 2011), of which TB could be considered one. These are conditions such as obesity, eldercare and mental health care, which are often accompanied by a complex variety of social and medical co-morbidities. The TB control system in London does not currently function as a network, but rather as an uncoordinated, fragmented, disparate system of largely autonomous sub-systems. *Whilst it is unlikely TB would be given the status of an "official" DH/NHS network in the sense of cancer or sexual health*[39]*, at least in the short term, there are aspects of the network approach which clearly could be beneficial to London's TB control system. Consideration could be given to learning about these networks and informally incorporating elements from them into London's TB control system*.

Theoretical Contributions

This study was broad in scope and has generated a number of empirical findings, as outlined above. To assist with understanding and theorising these findings, five theoretical frameworks were employed:

- complexity theory
- New Public Management
- professional dominance

[39] This idea was briefly considered in 2010 but not pursued. The likely reasons seem related to bad timing because of ongoing and massive NHS restructuring at the time, in addition to the financial costs associated with such a move.

- institutional/archetype theory
- Kingdon's (1995) theory of public policy development

The first three of these theories were used deductively, applied from the outset of the study and used, for example, to inform interview protocols and initial (and later) data analyses. The fourth theory used, institutional/archetype theory was applied as a supplementary means of identifying the mechanisms responsible for NPM embeddedness within the system. And the last theory, Kingdon's model of public policy development, was introduced to explain and theorise the low priority accorded to TB control in London. This expansive theoretical approach was challenging, and perhaps somewhat unorthodox, in that research often aims toward some sort of convergence, or theoretical resolution. This study, however, is theoretically divergent and sought the input of additional theories in its goal of identifying mechanisms and understanding causality in the organisational response to TB in London.

This research contributes to three bodies of literature:

1. the growing body of complexity theory literature within the social sciences, and within the fields of public management and healthcare in particular;
2. New Public Management research, including that which debates the status of NPM and whether we've entered a post-NPM era; and,
3. political science literature, specifically that which is focused on public policy development.

With respect to complexity theory literature, in addition to the major empirical contribution noted above, this study also responds to a call for research into the role played by environmental context when using complexity theory to study complex systems (Marion & Bacon 1999), as previously noted. This research has determined that context can indeed play a crucial role in influencing how a complex system functions: the complex system charged with controlling TB in London was found to be significantly influenced by the broader NPM-based political economy of which it is a part. It also confirmed earlier, but less well-acknowledged complexity theory research (Boons et al 2009, McKelvey 2003), which argues that self-organisation amongst system actors can be used to maintain the status quo within organisations, or indeed, be maladaptive.

Second, this research contributes to the NPM literature by highlighting the extent and pervasiveness of the paradigm's ongoing influence, particularly its focus on control and the impact arising from decades of efficiency drives focused on eliminating slack and redundancy within the system. Within London's TB control system, potentially beneficial complexity theory precepts were suppressed by these NPM precepts, thereby impeding the organisational response to the disease (Trenholm & Ferlie 2012).

Finally, this study adds to the public policy literature (political science), by validating and further developing Kingdon's (1995) theory of public policy formation. By using complexity theory to analyse how and why his "three streams" (problems, policies, politics) are cultivated, or not, within a public policy environment, this research developed Kingdon's own remarks (pp.223-224) that there are symmetries between his model and complexity theory. The complexity theory concepts of self-organisation and historicity/initial conditions were used to usefully theorise why TB control has not been able to secure a place on London's public policy agenda.

The following, then, are the major theoretical contributions arising from this research.

1. The "meta-meta aggregate" (Marion & Bacon 1999), or the environmental context within which a complex system operates, was confirmed as a potentially vital consideration in complexity theory research.
2. NPM embeddedness was observed as sufficiently strong and pervasive within the London TB control system that it negates or otherwise impedes the potentially positive complexity theory aspects also found within the system.
    a. NPM continues to be a major organisational archetype within the NHS; the much anticipated post-NPM era has not yet arrived in the UK healthcare sector. This finding validates earlier research by Ferlie & FitzGerald (2002).
3. Kingdon's (1995) model of public policy development was validated as a useful tool for understanding why some "conditions" become "problems" which merit a public policy response, while others do not. Also, Kingdon's theory was further developed by using complexity theory concepts to explain *why* the model's three streams might develop or not, building on the author's own remarks regarding possible complementarities between his model and complexity theory.

Future Research

The empirical findings and the theoretical and empirical contributions arising from this research point to various issues for further study and deliberation. With regard to TB control, it would be useful to study the organisational systems and responses used to tackle modern-day TB epidemics in other large cities. New York City's success in combating resurgent TB is well documented (Frieden 1995, Coker 1998, 2000), and some comparisons with London are drawn by Coker in his works. However, it would useful to look at the organisational responses of other large cities with high levels of migration and TB, comparing those in high-NPM environments, similar to London, to those in low or non-NPM systems. Related to this, a follow-up study conducted ten or so years from now on the status of London's TB control system would also be most useful, with a particular view to analysing whether there had been any re-integration within the system, or whether the current deep fragmentation is maintained. Similarly, and as alluded to in Chapter Eight, it would be useful to undertake a full comparator study of the response by London's healthcare system to HIV/AIDS versus TB.

At a more general level, this research identified some inherent challenges and difficulties associated with the capacity of high-NPM systems to respond to complex health problems. It would be useful to build on this by adding an international comparator from a low-NPM setting, such as France, Germany or Finland, to see how those systems respond to complex healthcare problems such as mental health, obesity and eldercare, as opposed to how the UK responds.

This study also revealed that encouraging co-adaptation and innovation within a heavily NPM-influenced milieu is difficult. It was suggested earlier that an absence of slack or redundancy within NPM environments, owing to relentless efficiency drives, combined with an unflinching fixation on control, makes it difficult for novelty and innovation to emerge within heavily NPM-influenced systems. System fragmentation also exacerbates the challenges associated with promoting vital co-adaptation and innovation. Further, the nature of relationships within these systems may also be impacted (for example, no spare time or opportunities to develop either strong or weak ties amongst system actors). It is rare for a high-NPM system to respond radically or creatively to problems. An exception in the UK has been the extensive de-institutionalisation within mental health services whereby psychiatric patients were moved into community-based settings. But even in this instance, the response was significantly influenced by strong social pressures and stakeholder input. Therefore, it

would be most useful and interesting to undertake empirical research in other NPM systems to see how or whether they innovate and/or co-adapt. Whilst advocates of markets might counter that the private sector, or perhaps the social enterprise sector, could be relied upon to introduce innovations into public sector settings, it is not obvious how a high-NPM system could accommodate or embed such innovations (to wit, the response by the NHS to the Find & Treat team). This could be part of a larger research agenda aimed at gaining a better theoretical understanding of innovation and co-adaptation within NPM settings.

The previous sections have outlined the empirical findings and the various empirical and theoretical contributions arising from this research, along with some ideas for future research efforts. This chapter, and thesis, will now conclude with some personal reflections and observations on the journey which has led to this point.

Reflections

Some readers may find the language used in parts of this thesis to be uncharacteristically blunt, and the findings more political than is the norm for academic management writing. I am not unaware of the potential consequences of some of what I've written here. The discussion on the low priority accorded to TB control in London by senior echelons of the healthcare system, and the intriguing absence of whistle-blowing from within the system, could be seen as particularly provocative.

The decision to include this information was taken after considerable deliberation and discussion in supervision and only after great caution was exercised to protect the identities of those implicated in the discussion. The overriding motivation for including this information flows from a sense of obligation to the many respondents who spoke so freely, candidly and passionately about their frustration at the lack of response from senior levels of the London healthcare system to TB in London. These sentiments came from across the spectrum of the London TB community interviewed for this research, including very senior and politically astute individuals; people who have built highly successful careers within an often politicised healthcare sector.

I have concluded these individuals knew exactly what they were doing when they spoke in such forthright terms to me about their frustrations and disappointments regarding the response from their superiors to TB control. These respondents were rightly confident that their identities would be protected, but they also knew full well that anything they said could find its way into these pages. This led me to conclude that

they saw me as a potential messenger who could "get the word out", in a credible, unbiased way, that London's TB control system is in desperate need of attention. I believe they saw the writings of an academic researcher, perhaps particularly a foreign one with no prior knowledge of, or involvement in, TB control or the London health economy, as a potential means of moving senior healthcare policy makers to action. Claiming a "public interest defence", I have perhaps pushed the traditional thesis boundaries by, in effect, answering this call for help.

On a more mundane note, this study has taught me to appreciate the power and importance of tacit knowledge in our daily lives and in the production of academic research. For instance, so much of the detail about a nation's healthcare system is taken for granted by those who grew up within the system, and its history and values are largely internalised and difficult to share with outsiders. And then there was the necessity of learning the ABC's of the new systems in which I found myself. So undertaking a doctorate-level study set within a healthcare system to which I had no prior exposure and featuring a disease which I assumed, naively, had been virtually eradicated, presented a host of often humbling challenges: "Commissioning??...what *is* commissioning?", "Why aren't hospitals called hospitals?" and "Is it really possible to have TB anywhere in the human body?" In the end, though, the steepness of my learning curve served to make the journey all the more rewarding. It has certainly proven to be an adventure, and one which I feel privileged to have experienced.

Appendices

Appendix A: Trenholm S, Ferlie E (2012)

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Title: Using Complexity Theory to Analyse the Organisational Response to Resurgent Tuberculosis Across London

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Keywords:

complexity theory, tuberculosis, healthcare organisations, NHS, New Public Management

Abstract

We employ complexity theory to analyse the English National Health Service (NHS)'s organisational response to resurgent tuberculosis across London. Tennison (2002) suggests that complexity theory could fruitfully explore a healthcare system's response to this complex and emergent phenomenon: we explore this claim here. We also bring in established New Public Management principles to enhance our empirical analysis, which is based on data collected between late 2009 to mid-2011. We find that the operation of complexity theory based features, especially self-organisation, are significantly impacted by the macro context of a New Public Management-based regime which values control, measurement and risk management more than innovation, flexibility and lateral system building. We finally explore limitations and suggest perspectives for further research.

Reference: Tennison B (2002). "Complexity in epidemiology and public health" in Sweeney K, Griffiths F (Eds.), Complexity and Healthcare: an introduction. Radcliffe Medical Press: Abingdon

Introduction: Complexity Theory and the Organisational Response to Resurgent TB Across London

This descriptive study uses complexity theory to examine the organisational response to a resurgent TB epidemic across London. Authors assert that complexity theory could fruitfully analyse both a complex and emergent health *phenomenon,* like a TB epidemic (Agar 1999), and the *organisational response* to it (Byrne 1998, Tennison 2002). We explore this second claim (our particular interest) by examining the multi-component system responsible for managing resurgent TB across London.

Despite much theoretical work, scholars note the need to apply complexity theory in real-life settings outside laboratories or computer-generated simulations (Houchin et al 2005). We add to the modest body of empirically informed research, specifically to an emergent literature combining complexity theory and public management (Rhodes & MacKechnie 2003, Teisman et al 2009, Rhodes et al 2011). Brown et al (1997) and Chiles (2004) are useful guides for us as both use longitudinal case studies, while highlighting the importance of context, time and relationships. In our research, the macro organisational and policy context proved highly significant and need to be accorded full attention.

Complexity theory offers a novel perspective on healthcare organisations and systems (Anderson 2005, Plsek 2001). We seek to operationalise in empirical analysis key features of complexity theory. All these complexity-based characteristics surfaced in the case, but their impact was intriguingly variable. Further analysis revealed that embedded New Public Management reforms significantly impacted how complexity-based features manifest themselves, hampering efforts at addressing the city's TB problem. Our initial research question is specified as follows:

> *What is the contribution of complexity theory in analysing the organisational response to resurgent TB in London?*

The paper is organised as follows. First we outline the context of our research. Then we review complexity theory literature, highlighting its application within healthcare, and also outline New Public Management principles found in the field. Then we describe our methods and data sources. Next, we present a narrative of the organisational response to TB across London, including vignettes which illustrate aspects of complexity theory and New Public Management processes. After discussing key findings, along with theoretical implications, we outline limitations and possible future research.

While our findings should prove useful to healthcare managers and TB specialists, our prime audience is scholars of healthcare systems and organisations. The case reinforces the importance of organisational contexts in complexity theory research, in this case, the legacy of healthcare macro reforms.

Context and Setting: The Resurgent TB Epidemic in London

London TB rates reached their lowest recorded levels in 1987 (Pearson et al 1996), after which they consistently increased (see Figure 1). Between 1999 and 2009, London TB cases increased by 50% (UK Health Protection Agency 2010), despite global incidence peaking in 2004 (WHO 2010, p. 32).

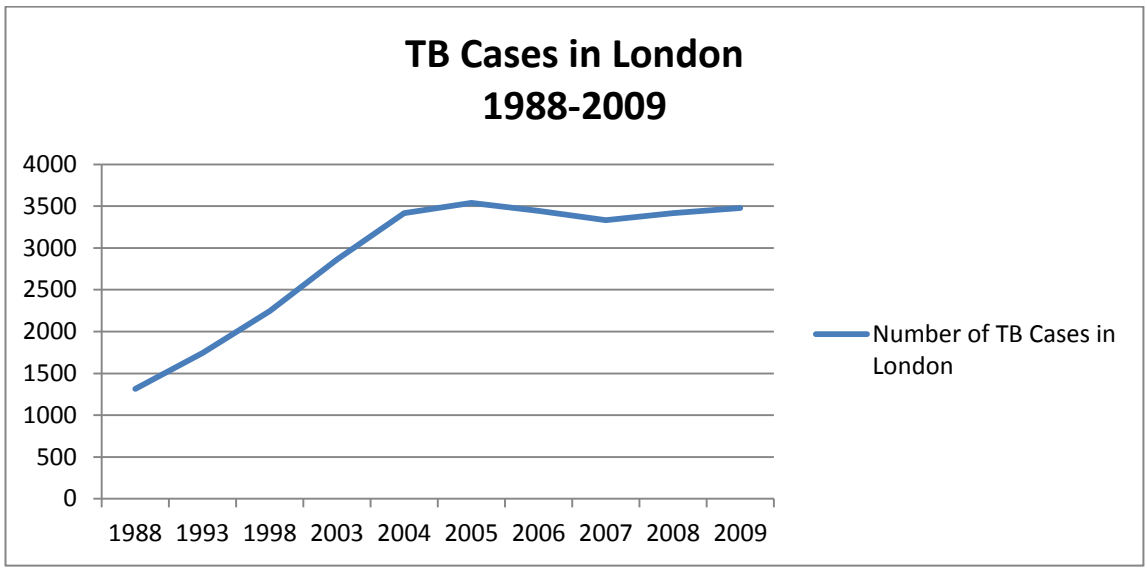

Figure 1: TB Cases in London (Source: various published HPA reports)

The rate of new TB infections in London (incidence) was 44.8/ 100,000 in 2009, with some boroughs exceeding 100 cases/100,000 (Health Protection Agency, 2011 [a]). Amongst other European cities, only Brussels (30.5/100,000) comes close to London (Health Protection Agency, 2011 [b]). Tuberculosis poses significant public health challenges in stopping latent infections becoming active and controlling onward transmission. The challenge lies with improving diagnosis and screening and with treating active TB disease, and the illness is compounded by economic and social factors – patients are often poor, with substance abuse issues, homeless, migrant and living in crowded quarters (Collinson and Ward 2010, Gandy et al 2002). Promoting disease awareness, encouraging marginalised individuals to seek diagnosis and treatment, and linking to primary care are challenging and involve many players. Collinson & Ward (2010), Craig et al (2007) and Story et al (2007) provide more detail regarding TB in modern London.

An Overview of Complexity Theory

Extending complexity theory to studying complex social phenomena is promising because of its focus on understanding relationships between and among individuals, organisations, and/or systems, and resulting collective behaviours and outcomes (Stacey 2003, p 333). Within complex systems, these outcomes are unpredictable, often non-linear, and emergent, with their sum greater than their parts (Blaikie 2007, p. 208). But complex systems, like all systems, may also perpetuate the status quo or suppress novelty and innovation (Boons et al 2009, pp 234-238). At the heart of complexity theory lies self-organisation (Rhodes et al 2011, p 14), “the process by which agents in a system interact with each other according to their own local rules of behaviour without any overall blueprint telling them what they are to accomplish or how they are to do it” (Stacey 1996, p.290). Complexity theorists argue that systems tend toward order (Kaufman 1993), “a stable pattern of relationships among elements” (Rhodes & MacKechnie 2003).

They recommend researchers “should look for the ways in which public service systems are creating ‘order’, what form/mode this order takes, and how this affects the overall performance of the system”(Rhodes & MacKechnie 2003). The importance of order creation on system outcomes emerged as a key factor in this research.

In reviewing the literature, we identify five relevant aspects of complexity theory:

1. Self-Organisation

   Self-organisation is a dialectical *process* of co-evolution among agents, comprised of relationships and behaviours. It has the capacity to create coherence and form patterns. The form which emerges is “radically unpredictable”, explaining the relationship between self-organisation and causality (Stacey 2000, p 128-130). While the emergent outcome may transform an organisation, the consequence of self-organisation may also be to “resist externally induced change” because of “ambition or need to survive” (Boons et al 2009, p 234-235). Agents in self-organising systems respond “according to their own capacity to respond” (Stacey 2003, p 333), within various organisational “control parameters” including:

   I. Rate of information flow
   II. Degree of diversity
   III. Richness of connectivity
   IV. Level of contained anxiety
   V. Degree of power differentials (Stacey 1996, p 179-182)

   The manner in which self-organisation occurs is debated. Some scholars argue that successful self-organising requires the “right” number of ties and informal connections among system members: too few ties and the system becomes moribund; too many ties and it becomes chaotic (Stacey 2000 pp 111-112). Others believe the intensity of the ties matters (Axelrod et al 2000). It is suggested that self-organisation occurs locally, at the micro level, later giving rise to meso and macro-level orders (Chiles 2004). Finally, self-organisation may contribute to systems’ abilities to balance ’’exploitation” (doing more of what they do well) and “exploration” (trying, discovering, or creating – e.g. innovating), and can trigger transformational change (Byrne 1998, pp 32-33, Axelrod et al 2000 pp 43-45).

2. Emergence of Novelty, or Perpetuation of the Status Quo?

   Novelty and the creation of “new properties” in response to environmental challenges might arise from self-organisation (Rhodes et al 2011, p. 14), or not, as discussed above. Components of a self-organising system may be “often oriented at maintaining their position and stability” (Boons et al 2009, p 235), aided by constraints arising from control parameters. Where novelty does occur, it is, by definition, unpredictable, and history and context matter (Byrne 1998, p 47). The composition and/or past actions of the components of the self-organising system can determine the nature of the novelty (Rhodes et al 2011, p 14) "due to multiple nonlinear interactions and feedback loops among the parts" of a system and not as the result of a ”big plan”' (Begun et al 2003). Finally, novelty emerging from self-organisation is not always positive (Plsek 2001), as when healthcare and other workers “game” the system to meet targets.

3. Non-linearity

An aspect of the unpredictability which arises from self-organisation are non-linear responses to change. Modest turbulence can produce an unexpectedly large impact, while large disturbances may be barely felt (Chiles 1994, Plsek 2001, Sarra 2005). An epidemiological example is how introducing crack cocaine into the street heroin market changed the drug using population and the entire dynamic of the heroin market (Agar 1999). Non-linearity can also be seen in the considerable resources invested in healthcare reforms with seemingly little system improvement (Plsek 2001).

4. Absence of a Single, Formal Leader

Crucially, self-organisation occurs without a single, formal leader (Drazin et al 1992), although this does not necessarily mean that no one is held accountable for the performance of the organisation/system (Houchin et al, 2005). Owing to the dialectical nature of self-organisation, "neither the individual nor the group is primary since they form and are formed by each other at the same time" (Stacey 2003, p 335); or, "There is control, but no one is 'in control'" (Stacey 1996, p 204). In healthcare, this often takes the form of "distributed leadership" (Gronn 2002).

5. Requisite System Variety

Complex systems exhibit diversity in the personal backgrounds, world views and experiences of system members. Such diversity enhances the system's capacity to manage complex challenges and adapt (Axelrod et al 2000, Stacey 2003 pp 375-5, 387-88).

Complexity Theory and Healthcare

Healthcare systems have been analysed as complex systems by various scholars (Anderson et al, 2005, Axelrod et al, 2000; pp. 75-77, 83-84, Byrne, 1998; pp.105-120, Curtis et al2010 [b], Plsek, 2001, Sweeney et al, 2002). There is interest in how a complexity perspective might enhance healthcare innovation, effectiveness and policy reform (Leykum, et al, 2007, Plsek et al 2001, Rhodes & MacKechnie 2003). Begun et al (2003) argue that healthcare innovation is challenging because of the "number…and fragmentation of producers involved", rendering ineffective standard efforts of "coordination and control". They argue complexity theory addresses this gap by acknowledging the importance of relationships within and between levels of the (nested) system, emergent strategy, past history and how the system co-evolves with its environment. Simmons' (2003) case study explores how the Welsh Public Health Laboratory Service might use complexity theory to develop its communicable diseases managed network.

Of particular relevance is complexity theory's emphasis on micro-level relationships (Drazin et al 1992), since "health care depends largely on productive interaction" (Plsek et al, 2001). Complexity theory recognizes "the recursive and dynamic connections between population health, health policy and health care" (Curtis et al 2010 [b]). Empirical complexity theory research in healthcare is, however, limited, tending to be of

a quantitative (Leykum et al 2007, Begun & Luke 2001), modelling-based (Agar 2002) or "speculative" nature, with writers exploring how complexity theory might be used to study a system, but stopping short of operationalising it (Simmons 2003). Exceptions are Marion and Bacon's (2000) research on organisational extinction using three care organisations and Begun et al's (2003) short case study of the Allina Health System. We need more complexity theory-informed research within real life healthcare settings.

The Macro Context and New Public Management.

Healthcare systems have been researched from various theoretical perspectives, with significant study in the UK from the New Public Management paradigm. We used this perspective to offer additional contextual insights when analysing our data. It proved helpful in understanding the various incarnations of self-organisation and why undertaking the action indicated proved challenging.

The paradigm conceptualises significant and enduring changes in public sector management from the 1980s (Hood, 1995). The UK was a high-impact site for New Public Management internationally, and the NHS a high-impact sector within the UK (Ferlie et al 1996). New Public Management ideas became powerful, top-down, and also practical 'reform' doctrines in the NHS, including:

(i) "managerialism" whereby managers assume greater control over clinical professionals, (Ferlie et al 1996, p 11), as in powerful NHS general managers and non-executive directors;
(ii) quasi-markets, rather than planning, allocate resources, with contracts replacing hierarchies as the basis of coordination within the NHS internal market;
(iii) the 'hollowing out' of previously vertically integrated ministries such as the Department of Health, with their policy making function eroded (Dunleavy, 1995), and now disaggregated into separate purchasing and providing functions and silo-like executive agencies ;
(iv) wide-spread use of measurement, risk management, strong contracts, targets and audits in a 'targets and terror' regime (Bevan and Hood, 2006), with poorly performing management teams being replaced; and,
(v) persistent top-down pressure for reform and constant top-down reorganisation (Ferlie et al, 1996, p 37; Moran, 2003)

The New Public Management is a late modernist project of organisational control. While "this omnipotent idea of control remains a fantasy much beloved" in the NHS (Sarra 2005), this faith in linearity and control places it in contradiction to complexity theory. We also explored the preceding core features in the case.

Research Design

We undertook a longitudinal case study of the inter-organisational 'system' responsible for managing TB across London from. Consequently, its boundaries extended beyond the NHS to include many other stakeholders.

We used a qualitative case study design, well-suited for explaining how and why organisational processes unfold (Stake 1994), and for still-developing fields (Drake et al 1998). This holistic approach fits well with the methodological precepts of complexity theory; particularly the need to understand, over time, relationships among entities (Blaikie 2007, pp 208-209) which could not be captured by other methods (e.g. surveys). This approach supports the study of nested complex systems through multi-level analyses (Eisenhardt 1989). Blaikie (2000) argues case studies' combination of rich data, observation, triangulation and conceptual analysis captures contextual richness and temporality. Byrne (2009) observes that comparative case-based approaches fit well with complexity theory because (a) they identify links between outcomes and case characteristics, i.e., causality patterns and (b) because they "are the foundations of useful theoretical descriptions of the social world", including in studying healthcare systems (Anderson et al 2005). Finally, the case study method can build theory, particularly in emerging fields (Eisenhardt 1989), and we here aim for a theory-building contribution as well as empirical analysis.

Methods and Data Collection

Our data were gathered over 21 months (2009-2011), using the methods and sources outlined in Table 1.

Semi-structured interviews	53 interviews with TB managers and healthcare professionals, both past and present, lasting 60-90 minutes.
Non-participant observation	Attendance at 55 Department of Health, NHS London, Health Protection Agency, and one-to-one informant meetings, totalling approximately 103 hours
Archival documents	Documents commissioned and produced by government, the Health Protection Agency, Department of Health, NHS, professional bodies and third sector, covering 15 years, with approximately 1200 pages analysed.

Table 1: Data Collection Methods

One researcher was granted significant access to London TB meetings, along with archival documents and email files. Most components of the TB system were co-operative in consenting to meeting observation. Semi-structured interviews followed a pro-forma designed to capture the history of TB control efforts with questions derived from our initial literature review covering complexity theory and New Public Management. Interview participants were identified using TB Commissioning Board lists. Snowballing was used, identifying people no longer working within the system. Meetings between the authors discussed the progress of fieldwork and elucidated initial analysis. One author examined the interview transcripts, field notes, and documents on this basis, coding them using HyperRESEARCH software against a set of agreed codes. But as we lacked electronic versions of older documents, most analyses were conducted manually, by (re)reading documents to surface themes, identify critical incidents and draw

comparisons. Further meetings elucidated an overall approach to telling the narrative of the case, for example, using theoretically related vignettes. The entire data set was searched systematically against the key themes for examples, e.g. positive and negative instances of non-linearity.

More concretely, we were guided by Ragin and Amoroso's (2011) model, below. Here researchers produce images by linking pieces of evidence together. These images are combined with analytic frames, derived from ideas and social theory, providing "the context for creating and understanding the image, establishing conceptual boundaries around the evidence-based image…representations appear to audiences as finished products, complete with images and frames" (Ragin and Amoroso 2011, p 75).

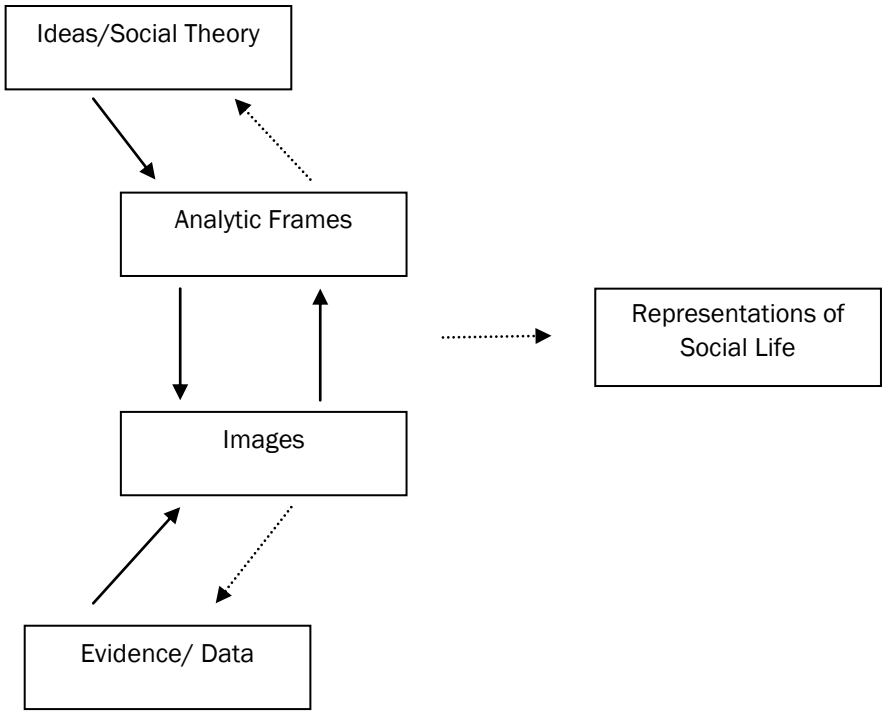

Figure 2: Model for Social Research (Ragin and Amoroso 2011)

We agree with Langley's (1999) observation that process research builds theory when it "selectively takes concepts from different theoretical traditions and adapts them to the data at hand, or takes ideas from the data and attaches them to theoretical perspectives, enriching those theories as it goes along." Tsoukas and Hatch's (2001) arguments regarding the value of narrative in organisation-based complexity theory research, along with Stacey's (1995) warning about using reductionist, hypotheses-testing approaches to study complex, non-linear phenomena were heeded.

Ethics approval was received from a local Research Ethics Committee.

Findings: The Story of Pan-London TB Control

We here provide a narrative of the pan-London organisational response to a resurgent TB epidemic. We initially mapped the 'system,' finding almost 70 entities involved, largely drawn from different public services, but including the private sector (prisoner transport and laboratory services), third sector, parliamentarians and a not-for-profit service provider. The London TB Commissioning Board and the London TB Clinical Working Group derive their memberships from these entities. These two important bodies (established in 2008, but with various, similar precursors) seek to develop a London TB strategy bringing together organisations to share best practice and co-ordinate efforts, and ultimately reduce TB levels. The Clinical Working Group advises the Commissioning Board clinically and has a larger, mostly clinical, membership. The Commissioning Board is advisory with no formal authority or budget-holding power, and relies on persuasion in achieving objectives.

Between 1996 and 2011, thirteen reports analysed London's TB problem, most concluding with calls for action. Nonetheless, TB rates continued to climb. Table 2 presents the overall history of the response.

Year	Key Event(s)	Commissioned Report/Study
1987	London TB rates at their lowest recorded levels	
1993	Regular 5-yearly report showed TB rates in London increased by 47% between 1987-93 (Pearson et al 1996). First 'working party' of London Consultants in Communicable Disease Control established – focus on surveillance	
1996	Interdepartmental Working Group on Tuberculosis formed, led by Department of Health	The Interdepartmental Working Group on Tuberculosis, (i) The Prevention and Control of Tuberculosis in the United Kingdom: Recommendations for the Prevention and Control of Tuberculosis at the Local Level and (ii) Tuberculosis and Homeless People (Dept. of Health and Welsh Office)
1998		○ Interdepartmental Working Group on Tuberculosis – Focus on HIV and Drug-Resistant TB (Dept. of Health) ○ Tuberculosis control in London – The Need for Change (NHS Executive)
1999	"TB in London" group formed	Improving TB Control in London (NHS Executive)
2001	Geographically sector-specific TB groups form across London Concerns raised re: port health screening	TB Control in London: Next Steps (London TB Group for London NHS Regional Office)
2002	Short trial of mobile x-ray unit	Getting ahead of the curve: A strategy for combating infectious diseases (Department of Health)
2003	Health Protection Agency created	Tuberculosis in London (London Assembly Health Committee)
2004	Global TB rates peak. Borough Clinic rates start to fall.	Stopping Tuberculosis in England: An Action Plan from the Chief Medical Officer (Department of Health)

2005	"Stopping London in TB" group formed Mobile X-ray Unit funded by Department of Health	
2006	Health Protection Agency criticizes port health screening	
2007	Find and Treat team formed	Tuberculosis prevention and treatment: a toolkit (Department of Health)
2008	TB Commissioning Board and Clinical Working Group formed	An Audit Evaluation of Pan-London TB Services and Training Needs (Commissioned from London Southbank University)
2009	"Department of Health effectively out of the TB business"?	Tackling Tuberculosis in England: the PCT response to the challenge (Commissioned by The All-Party Parliamentary Group on Global TB, The British Thoracic Society, TB Alert and The Royal College of Nursing)
2010	Original Find and Treat team winds down Cohort Review starts New airport x-ray machines installed	London TB Service Review and Health Needs Assessment (Commissioned from the Public Health Action Support Team)
2011	Control Board concept quashed	

Table 2: Timeline of Key Events and Reports

Our narrative now develops five vignettes to present empirical findings. Complexity theory is used in order to illuminate these vignettes, in which New Public Management is often an important part of the story.

Vignette 1: A tale of two self-organised initiatives

Homelessness, substance abuse and previous imprisonment are significant TB risk factors (Story et al 2007). The Department of Health responded positively to a funding request from an enterprising TB nurse and associates to fund directly (and exceptionally) a trial (2005) of a mobile x-ray unit offering TB screening at homeless shelters and other locations with at-risk populations . By 2007, "the Van" spawned an associated team, "Find and Treat" (F&T), to find active TB cases and ensure more patients completed treatment. The F&T team (10 staff) was multi-disciplinary, comprising nurses, caseworkers, radiographers, and operations staff, including former or seconded Department of Health and NHS employees. They adopted unorthodox working methods, as suggested by their patient base. They worked odd hours and employed creative techniques to locate patients and administer treatment (using Skype to watch a TB patient take his tablets). But theirs was a perilous existence. They never secured long-term funding and became isolated. One key informant said, "It sits in the middle, in the middle of nothing, nobody asked for it, nobody wanted it. It's now become an entire faction… something separate…", while adding it did "good work"." Despite positive, independent assessments, F&T became alienated from the NHS mainstream; they were seen as a child of the Department of Health, unmanageable and 'risky' given unusual work practices and unclear governance, as a Community Interest Corporation.

The NHS took little solace from F&T's advisory panel of senior TB clinicians, researchers and epidemiologists. A drive to bring the team under control meant that it effectively

ceased to exist (2011). The once maverick group working out of edgy offices in Soho now find themselves, in reduced numbers, working in cubicles in an NHS facility, and providing services within a defined, conventional NHS contract. Their long-term future is unknown.

In contrast, "Cohort Review" presented less challenging self-organisation. Another nurse-led initiative (but with full consultant support), this systematised patient case review system means that nurses meet quarterly to present summaries of TB cases, including treatment outcomes. During presentations the Health Protection Agency compiles real-time data and provides feedback. Unlike the maverick F&T, Cohort Review reinforces the typical NHS focus on measurement and control and has mainstream medical endorsement. Cohort Review quickly gained NHS management support and spread across London,

We comment that F&T and the Cohort Review offer contrasting examples of self-organisation. F&T challenged the NHS status quo and focus on control and risk management, while Cohort Review reinforced it. The NHS macro system rejected F&T but embraced Cohort Review.

Vignette 2: Inner-City Clinic: Local Self-Organisation

This Clinic is in an economically deprived, over-crowded and migrant-dense borough, all factors associated with increased TB rates (Collinson et al 2010, Craig et al 2007,). However, TB incidence here has fallen since 2004. The Clinic team includes doctors, nurses and outreach workers, working across and outside traditional NHS boundaries with a distributed leadership model. Their ethos is patient-centric looking at patients' overall health and wellbeing, beyond TB treatment. The team works with various colleagues, securing housing, sexual healthcare and substance abuse support. Case workers cold-call carwashes (major employers of poor migrants), pool halls and betting shops, looking for TB cases. They commit to treating identified TB patients, visiting them in squats and other unusual locations. They develop rapport with patients to assist compliance, providing used toys for patients' children and reimbursing some household expenses. The team-oriented approach gives members some discretion, whilst they remain accountable to the team.

We comment that the Clinic illustrates self-organisation resulting in local innovation. While well-known, the clinic does not extend beyond its borough and consequently, presents less visible risk for the macro NHS than Find & Treat. Its approach has not been replicated, despite clinic staff sharing their successes.

Vignette 3: System Fragmentation: A 'stand alone' Health Protection Agency and a Hollowed-Out Department of Health

During the early–mid 1990s, various Consultants in Communicable Disease Control based in local authorities across London met collectively, with Department of Health support, to address rising TB rates. Published data (Pearson et al 1996) highlight their importance and key respondents credited them with forcing attention on the TB problem.

Later NHS macro-restructuring produced two significant changes. First, a national arms-length advisory body was created (2003) to advise on public health, including TB. Such 'spin out' bodies are a typical New Public Management creation, with the new Health Protection Agency subsuming many of the Consultants. As their role is advisory, they felt they lost old authority to compel local officials to act against infectious diseases like TB. The Consultants were no longer a core part of mainstream NHS organisations but were relocated to a specialist, stand alone agency.

Secondly, the Department of Health lost some senior level policy expertise in this field, consistent with the argument (Dunleavy, 1996) that New Public Management produced an excessive swing from policy making to management. The TB field experienced a gradual reduction within the Department of policy level resources. A key respondent observed:

> *"I suppose what has changed is the size of the groups dealing with infection… the Department of Health reduced fairly dramatically…about ten years ago… So whilst they previously had somebody…a scientific advisor …senior sort of civil servant who, basically all they really did was TB and flu…a lot of those…got replaced with a much smaller core staff who were dealing with all infections. And so there is a certain amount of less, lower level of expertise there than there was in the past."*

While some respondents did not perceive significant change, one well-placed respondent said that by 2009, the Department was effectively "out of the TB business", reduced to drafting replies to Ministers' and MPs' questions. Another respondent observed TB was not mentioned in a key financial document (2010/2011) from the division responsible. By 2011, only one full time person in the Department worked on the TB file, covering all England.

We comment that the London TB system exhibits New Public Management style features of disaggregation and system fragmentation. The Department of Health lost policy making capacity and creating the Health Protection Agency had the (possibly unintended) consequence of disempowering advisers within the wider TB control system.

Vignette 4: Thwarted Reform: NHS Management wants Commissioning NOT Control Board

After long discussion, the TB Commissioning Board hired (2010) external consultants to produce a comprehensive "needs assessment" which recommended the existing TB *Commissioning* Board be replaced by a TB *Control* Board representing the Mayor of London, local authorities, social services and housing, and the third sector; taking a broad public health and population-based perspective. It would have clear accountability lines, overseeing a single, centralised commissioning function and budget. The idea was based on the 1990s New York model used when tackling (successfully) its TB epidemic. There was broad support, even excitement, and the idea gained momentum but was unexpectedly abandoned, given managerial staffing changes and further NHS restructuring. NHS leadership argued that the TB community must work within standard commissioning and abandon the holistic Control Board. Regarding a document produced by the Clinical Working Group, consistent with a Control Board approach, a key

NHS manager commented, “If I were cynical, I’d say (that) document is one that sits on a shelf, whereas this (a commissioning document) is really used.” This decision to abandon the TB Control Board was taken unilaterally by NHS management. Even senior clinicians, who had enthusiastically supported the Control Board concept, acquiesced. The 2010- Report may take its place on the shelf beside twelve previous reports since 1996, all urging action and change.

We comment that this vignette suggests self-organisation which supports the status quo. Self-organisation fed in to a consistent aversion by the TB Commissioning Board (and its precursors) to implement recommendations resulting in significant change to NHS macro systems. It suggests the New Public Management-inspired purchaser-provider split is embedded, with a system-wide ‘Control Board’ incompatible with such policy.

Vignette 5: Port Health Screening: An Investment with Non-Linear (Negligible) Outcomes

New UK entrants with a long-term visa may be screened for TB by chest x-ray at arrival. Such referrals appear somewhat arbitrary. A 2006 Health Protection Agency report states: “of around 270,000 people entering the UK for more than six months from countries at high risk of TB, only about 73,000 were screened by X-rays; and as a result of these there were only 90 TB diagnoses. It was not possible to establish how many of these were infectious”. With approximately 8000 new UK TB cases annually, this represents 1.1% of new cases. Chest x-rays do not pick up latent TB infections or non-pulmonary TB.

If an arriving passenger is identified as potentially infected, the Health Protection Agency later contact and instruct the person to attend the local TB/chest clinic for testing. This assumes new arrivals provide addresses still valid later - often not the case according to respondents. As one stated, “port-of-entry x-ray screening is ridiculous. It is so flawed and it costs millions…People have faith in a system that’s deeply flawed.” The problems with port-of-entry screening have been repeatedly rehearsed, including in the 2001 document “TB Control in London- Next Steps”; and the Health Protection Agency (2006) recommendation for an urgent review. Years later, the system carries on, with new x-ray machines recently installed at a major London airport. Because of its political profile, it is risky for management to redirect this flawed investment.

We comment that the vignette illustrates (negative) non-linearity, whereby significant and repeated public expenditure has minimal positive impact. We searched for “positive” non-linearity in our data but could find no examples: for instance, promising but “deviant” local pilots were not rolled out.

Vignette	Aspect(s) of Complexity Theory Exhibited	New Public Management Mitigator/Influence
1. A Tale of Two Self-Organised Initiatives	○ Self-organisation with some emergent innovation, but ultimately, perpetuates the status quo. ○ No single leader ○ Diversity of inputs (within Find & Treat)	○ Empowered NHS management and high risk aversion influence "takeover" of Find & Treat ○ Purchaser-provider split meant Find & Treat services were formally commissioned, including detailed targets. ○ Focus on NHS measurement, control, and risk aversion supported spreading Cohort Review
2. Inner-City Borough Clinic: Local Self-Organisation	○ Self-organisation resulting in innovation ○ No single leader ○ Diversity of inputs ○ Emergence of novelty	
3. System Fragmentation: "Stand alone" Health Protection Agency and the Hollowing-Out of the Department of Health		○ System fragmentation e.g. creation of the Health Protection Agency ○ Disaggregation of the Department of Health
4. Thwarted Reform: NHS Management wants Commissioning, not Control, Board	○ Self-organisation (reinforces status quo) ○ Diversity of inputs	○ The purchaser-provider split, and service commissioning , is embedded ○ Strong measurement, audit and risk aversion means initiatives outside a commissioning focus are too radical and risky
5. Port Health Screening: An Investment with Non-Linear Outcomes	○ Non-linearity	○ Top-down pressure results in the continued investment in airport chest x-ray screening ○ Risk aversion

Table 3: Summary Analyses of Data Provided by Vignettes

Discussion of Findings

Self-Organising, Yes; But Why Differences Between Pan- London and Local Levels?

As comparison is usefully employed in a complexity-focused case study (Byrne 2009), we analysed both the pan-London and the Clinic "sub-system" levels. All five complexity theory features were present in both levels, but the manner in which these features manifest differs significantly (see Table 4).

Complexity Theory Features	Evidence at Pan-London System Level	Assessment of the strength of the complexity theory feature and nature of its impact	Evidence at Inner- City Borough Clinic Level	Assessment of the strength of the complexity theory feature and nature of its impact
Absence of single, hands-on leader	No single leader, and accountabilities, are unclear. Director of Public Health (NHS London) formally responsible, few respondents believed this to be real .	Strong (negative)	No single leader, although the senior TB consultant is supportive and assumes accountability for the clinic.	Medium (positive)
Requisite variety/diversity of inputs	Instances of diverse inputs, but limited and localised. The system is dominated by traditional healthcare professionals, many ambivalent about the third sector, patient representatives. Frequent acknowledgement of need for input from local authorities, especially housing, but limited impact	Low (neutral)	Yes, see Vignette 2.	Strong (positive)
Non-linearity	Yes. But input leads to little output. See Vignette 5. No evidence of instances where small inputs lead to unexpectedly large outputs.	Strong (negative)	Yes. Clinic's TB team changed their borough's housing policy to provide accommodation for TB patients during treatment.	Medium (positive)
Self-organisation	Yes, see Vignettes 1, 3.	Low (negative)	Yes, see Vignette 2.	Strong (positive)
Emergence of Novelty	Very limited, see Vignettes 1,3 .	Low (negative)	Yes, see Vignette 2.	Strong (positive)

Table 4 – Complexity Theory Features Within the Pan-London TB Control System and an Inner-City London Clinic

Complexity features at the pan-London level often negatively impacted the system's ability to manage TB, while locally they enhanced the (sub)system's efforts. We suggest that this is because strong New Public Management features at the pan-London level significantly influence self-organising behaviours. So whilst self-organisation is evident at both levels, it sometimes led to innovation but sometimes to retaining the status quo. Locally, self-organising behaviours were sufficiently 'under the radar' to avoid New Public Management colonisation. However, the more visible pan-London system was driven by New Public Management-inspired objectives of control and risk aversion.

Strong New Public Management at Pan-London Level

Our data show the embedded (negative) influence of New Public Management-style organising at the pan-London level. Vignette 4 notably demonstrates New Public Management's enduring power, especially the purchaser-provider split, systemic fragmentation and strong NHS management. This reduces a system's diversity, contra complexity theory, and its capacity to innovate laterally.

New Public Management theory prescribes formerly powerful and vertically integrated Departments like Health lose authority as traditional areas of responsibility are spun-off into arms-length agencies (e.g., the Health Protection Agency), privatised (laboratory services) or out-sourced (TB awareness-raising) (Ferlie et al 1996, p 13). The stress on operational management downsizes the policy core, perhaps excessively (Dunleavy 1995). All these trends are visible in Vignette 3.

Our assessment is that, traditionally, the Department of Health undertook a more significant policy role. Spinning out the arms-length Health Protection Agency meant it no longer had financial or line management authority. A key informant stated, "I struggled, actually, to understand how the HPA was going to control (TB) when it didn't really have a mandate to actually, you know, do anything".

Adding a subsystem (the Health Protection Agency) to a thriving complex system in response to environmental demands should enhance the system. However, this potential was blighted by the organisational context into which it was introduced. Specifically, New Public Management-style reorganisation weakened advice from 'stand alone' Health Protection Agency advisors, usually justified in terms of resource shortages.

Our Overall Added Contribution

We suggest there are two additive contributions from our analysis, Firstly, we conclude a complexity theory perspective offers an interesting but by itself, partial, framework for analysing the organisational response to London's TB epidemic. The wider organisational and policy context is vital and needs to be incorporated fully in analysis (Byrne 1998, p 47, Marion and Bacon 2000); specifically, the ongoing, strong influence of macro New Public Management forces impacting the pan-London TB control system's (in)ability to respond. This observation regarding the macro context is compatible with complexity theory: Marion and Bacon (2000) suggest the "meta-meta aggregate", or the macro context in which complex systems operate, is vital. While they do not fully operationalise this argument, as neither do Begun et al (2003) in their brief discussion

of how the Brazilian healthcare system tackled AIDS, we here provide a major worked example.

Secondly, we suggest complexity theory is more robust when informed by analysis of the macro policy and organisational contexts of healthcare systems. Complexity theory's nuances (e.g., different manifestations of self-organisation, how differing ties/relationships impact the system) also become clearer when analysed in this broader context, including at different levels within a nested system. As Curtis et al (2010 [a]) observe "complexity theory describes, but does not always explain the complex and dynamic features of health systems", and may need to be combined with other paradigms. Recognising the importance of New Pubic Management features within the macro context is an important component of the material being explained. The perceived utility of additional theoretical perspectives may be related to conflicting views amongst complexity researchers regarding teleology; specifically whether systems move towards a pre-determined destiny or an indeterminate, transformative, destiny (Stacey et al 2000, p 14). Researchers in the former school, largely drawn from the natural and physical sciences, see systems as ultimately reducible to their constituent parts, and search for means of control and prediction. Complexity theorists in the latter, "transformative school" (to which we are closer) are less concerned with predictability or control and focus on relationships and why systems change/innovate or not. Such researchers are likely to explore alternative theories which help analyse emergent and unpredicted forces apparent in the healthcare systems analysed.

The nature of 'ties' at the pan-London level may also be significant. With 70 components, the system is highly fragmented (reinforced by New Public Management restructuring) and interview data revealed minimal informal or robust ties. There may be insufficient slack (given resource constraints and efficiency drives) and too much prescription (New Public Management-inspired contracts and performance measures) to foster self-organisation where system members feel secure in challenging the status quo.

Beyond New Public Management: Gardeners, Engineers and Synchronicity
We now add a second research question, given our findings: *Does complexity theory provide a theoretical basis for understanding the shortcomings of the New Public Management paradigm and practices within our case?*

In the pan-London TB case, the New Public Management paradigm's excesses (e.g., focus on measurement, control and risk aversion) are illuminated by a complexity based analysis. The complexity literature suggests the (in)ability of managers within complex systems to influence long-term outcomes (Stacey 1995, 2000, Kernick 2002, Boons et al 2009). Boons et al (2009) propose the role of managers is to co-ordinate the processes, with agents in self-organizing systems encouraging "synchronicity". "Creating conditions, however, is different from exerting control", they observe. Kernick (2002), argues that managers in complex healthcare systems should be gardeners not engineers; preparing and nurturing fertile ground so innovation might emerge, rather than attempting to direct and control.

Within our case, "gardening" tactics were evident in the borough Clinic and in the original Find & Treat team. Engineers dominated the "repatriation" of the Find & Treat team to the mainstream NHS and shifting the holistic Control Board back to a narrower

commissioning focus. There was more pan-London engineering than gardening and producing synchronicity is decidedly challenging. New Public Management governance produced a fragmented, risk-averse "system of subsystems", each with its own management, goals, targets, and resource needs, and focused on measurement, control and formal contracting.

Generalisability, Limitations and Possible Further Research

We have produced a single (if large scale) case study, and further TB-related research in another major European city or on similar issues, such as HIV or infection control, would be useful to explore external generalisability.

The UK is famous – perhaps notorious – for continual top down healthcare reorganisation (Moran 2003). This may be a UK-specific pattern so comparative studies (Hood 1995) of other complex healthcare issues are needed from 'low New Public Management' systems (e.g. France, Germany). More broadly, complexity theory offers concepts lying at the opposite extreme to the New Public Management ideas and practices that have so dominated UK healthcare policy. Such ideas may prove useful in exploring other UK healthcare 'systems' with chronic policy failure: elder persons' services is a prime candidate for future work.

Finally, there are practical implications for London's TB policy, and perhaps beyond. The inability of a leading city to regain control over a disease once nearly eradicated should be analysed within its broader, and negative, organisational context. We hope our analysis will provoke reflection, greater recognition of TB as a public health issue, and policy renewal.

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APPENDIX B: Data Collection

Non-Participant Observation

Observations and evidence were gathered over 25 months (2009-2011), including via non-participant observation at 56 meetings involving the DH, NHS London, HPA, individual informants, Parliamentarians and third sector stakeholders, for a total of 111 hours of observation. My attendance at meetings was non-participatory, but, as would be expected with field research conducted over a long period and involving a reasonably stable cast of actors, I did have informal interaction with meeting participants, usually during meeting breaks and immediately before or after the actual gatherings. In fact, these ad hoc, informal conversations produced some of the more interesting data collected. In addition to the formal meeting minutes which were usually produced, copies of which I received during their routine distribution, I also took my own notes, including observations and "notes to self". These field notes often highlighted the meeting mood and dynamics, interesting and odd happenings, or anything which I thought might merit further consideration or be of some consequence, even if it wasn't immediately clear at the time as to why. All of these field notes were typed-up and entered into HyperResearch for coding and analyses. As electronic versions of the formal meeting minutes and supporting meeting documentation were also available, these, too, were coded and entered into HyperResearch. The table below, summarises the nature and number of meetings attended.

Meeting	Number of Meetings Attended
TB Commissioning Board (TBCB)	10
TB Clinical Working Group (TBCWG)	12
Sector-level TB Working Groups	5
TB Workforce (nurses' group)	3
Isoniazid Resistant TB (HPA led)	1
All-Party Parliamentary Group on TB	2
One-on-one informant meetings	14
Various (TB stakeholders, NHS London)	9

Semi-structured interviews

Yin (2003:89-90) identifies interviews as "one of the most important sources of case study information" and key in assisting researchers to serve the needs of their line of inquiry. During this study, I conducted 58 interviews with 55 different people using a

semi-structured interviewing format. Interview participants were mainly identified using lists supplied by my main contact at the TB Commissioning Board; however, snowballing also proved effective, particularly in identifying people no longer working within the TB control system. Two of the interview subjects worked in TB control in Canada (Montreal and Ottawa) but all others were current or former participants in London's TB control system. Informants represented a broad spectrum of healthcare professionals, managers and representatives from the third sector. Interviews ranged in length from 30-150 minutes, with an average length of approximately 80 minutes. All interviews were fully transcribed, most by two professional transcribers. A breakdown of interview subjects is shown in the table below.

Interviewee's Professional Group	Number Interviewed
Clinical Consultants	12
Other Consultants (i.e., public health, epidemiologists)	12
Nurses	7
Managers	13
Third Sector	2
Outreach/Fieldworkers	6
Other	3

The interview pro-forma was constructed based on the fifteen key "signs and symptoms" of complexity theory, NPM and PD, which were discussed in Chapters Three and Four, as these attributes also capture the conceptual frameworks used in this research. A copy of the interview pro-forma, as approved by the King's College Research Ethics Panel, follows in Appendix E. As per Yin's observation, above, ensuring that interviews followed the approved pro forma was a means of systematically pursuing my line of inquiry and also assisted with my goal of data triangulation.

Archival Document Review

Reviewing archival documents traditionally dominated social science research. While technological developments mean that it has recently been eclipsed by survey and field research, documentary research has also been bolstered by advances in technology (Henn et al 2006:109-110), with better access to documents, often in electronic form, than ever before. However, researchers should view these, and all documents, as

socially constructed and reflective of the views and beliefs of the author(s), rather than as neutral and value-free materials (Henn et al 2006:112). "Selective survival of documents,...governed by the values, perspectives and assumptions of those who are in a position to decide what should and should not be made available to researchers", may also, in effect, "edit" what is available, and should be acknowledged as a factor which may have somehow impacted the research (Henn et al 2006:121).

Along with the transcripts of interviews and attending meetings, over 1200 pages of archival documentation relating to TB control in London was collected and analysed for this study. Much of this documentation was publicly available, such as annual reports and TB epidemiological reports, but much was also acquired from various informants, both past and present, from within the TB control system.

This combination of interviews, observations and archival documents offered multiple sources of evidence to promote data triangulation, in which "facts" are corroborated by more than one source. Triangulation, a defining feature of case study research, enhances a study's validity and value (Yin 2003:97-99). This research gathered a significant amount of data from a wide variety of sources which proved more than adequate to conduct the analyses required for this research. In fact, it was found difficult to use the high volume of data fully in a thesis limited to 100000 words quantity of the data collected was greater than could be accommodated in this thesis. The table below offers an overview of the data collected for this research.

Semi-structured interviews	58 interviews with 55different people, representing a broad array of TB and healthcare professionals, both past and present. Interviews lasted on average 60-90 minutes, but ranged from 25-140 minutes in length.
Non-participant observation	Attendance at 56 internal DH, NHS London, HPA, and one-to-one informant meetings, totalling approximately 111 hours
Archival document review	Documents commissioned and produced by government, the HPA, DH, NHS, professional bodies and third sector, covering 15 years, with approximately 1200 pages analysed. Formal minutes distributed from above noted meetings

APPENDIX C: Data Analyses

Data Reduction

Qualitative research is well-known to produce mountains of archival, observational and interview data, since, for a qualitative researcher, almost anything observed or discovered during the course of data collection, can, at least theoretically, be considered as data. While some of this volume-related challenge is addressed by placing boundaries around the case, as discussed previously, researchers may still be left with vast quantities of data. To Miles and Huberman (1994:10-11), data reduction is "the process of selecting, focusing, simplifying, abstracting and transforming" field notes and transcriptions and occurs throughout the entirety of the research process, up until the research is written up. Its objective is to assist with the generation of accurate and verifiable, final conclusions.

During this research, I often wrote "notes to self" in addition to the usual recorded observations collected during or immediately after an interview or meeting. These took the form of reflective remarks or remarks written in the margins of my notes, with the goals of capturing "ideas and reactions to the meaning" of what I was seeing and hearing (Miles and Huberman 1994, pp 66-67). I also made use of document summary forms, as suggested by Miles and Huberman (1994, pp 54-55) as a means of managing the volume of archival documents and providing a quick overview of the significance of specific documents, particularly longer ones.

However, coding comprised my major approach to data reduction, consistent with Miles and Huberman's (1994) advice. I used the HyperResearch software package to store, organise and code interview transcripts, typed field notes, meeting minutes, agendas and, where I had access to electronic versions, archival documents. An electronic "snapshot" of a page of evidence coded using HyperResearch is found in Appendix M. The software was useful in a number of ways. It helped with organising the vast amount of data collected throughout the research, including sorting and retrieving data fragments and quotes. It was also a helpful means of validating the themes which had been identified from reading and re-reading the data. As with any data analysis program, the software was limited to working with the raw data which it was fed, including transcribed interview transcripts, field notes, and the set of codes used to analyse the data. Undoubtedly a different researcher would derive a different data set, including a different set of codes, and the software would return different data

of the state of TB control in London. Nonetheless, the process of learning and using the software was useful, particularly for its capacity to validate the findings from the much lower tech process of data immersion through reading and re-reading.

The codes used were chiefly derived from the list of 15 "signs and symptoms" representative of the three theories being applied deductively in this study (five codes from each of the three theories, as discussed in Chapter Three and Four). But a number of codes also emerged inductively, as I read through the interview transcripts and other documents. As the process of reading, re-reading and coding progressed, the combination of those inductively derived codes, along with those reflecting the three original theories used in this study, lead me, inductively, to the use of Kingdon's (1995)theory of agenda setting in public policy making.

Finally, I enlisted the assistance of another King's College London PhD researcher to "check-code" samples of my data in an effort to enhance reliability (Miles & Huberman 1994:64-65). This proved a useful exercise in that she brought new insights and asked useful questions, although we agreed in terms of overall conclusions.

Data Display

Reduced data must be organised and displayed to support the research's ultimate objective of reaching conclusions (in effect, often a means of further reduction). "Looking at displayed data helps us understand what is happening and to do something", including either further analyses or moving on to the next step (Miles & Huberman 1994:10). For this study, data displays took various forms, including the production of frequency counts and bar graphs of coded material, and various tabular displays, some of which are found throughout this thesis.

Drawing and Verifying Conclusions

Drawing conclusions, or "representations" in the language of Ragin & Amoroso (2011), is the culmination of the research process. But it comes about iteratively and while it is the rare researcher who does not reach some preliminary conclusions in the early days of a study, Miles & Huberman (1994:11) are clear in their admonition that these early conclusions must be tentative and held with "openness and scepticism". They also argue that verifying conclusions is a vital step for researchers, requiring that conclusions be somehow tested for their validity. "Otherwise we are left with interesting stories about what happened, of unknown truth and utility", (Miles & Huberman 1994:11).

Within a critical realist paradigm, where the focus of the research is on uncovering often invisible mechanisms, validation in its traditional, logico-scientific form presents a particular challenge and "entails the epistemic fallacy" in that "an empirical connection in itself cannot identify the active mechanism...In other words, empirical regularities are pieces in the jigsaw puzzle of searching for mechanisms, not arbiters" (Danermark et al 2002:153-154). In this study, regularities were identified via a combination of HyperResearch (which identified the frequency with which codes appeared in the data) and by reading and re-reading the data, and discussing preliminary "hunches" and ideas during supervision. For instance, the low priority accorded to TB control was a regularity observed empirically, but identifying the mechanisms which caused it, was a separate exercise and is discussed at length in Chapter Eight.

Despite the challenges, verifying conclusions is important and in this study another PhD student at King's College London reviewed select data, including some of the empirical data found in Chapters Six and Seven, alongside my coding scheme, and offered her views and tentative conclusions. As with the simpler code-checking exercise, this proved useful. Further verification came by way of the numerous discussions during supervisory meetings regarding the data and findings presented here, including significant discussions regarding themes and conclusions. Finally, four senior members of the London TB Commissioning Board reviewed final drafts of Trenholm and Ferlie (2012) prior to its publication, the contents of which is drawn from this research and whose key findings are also contained in this thesis. These individuals offered useful feedback and suggestions, but the findings and conclusions of the paper were not challenged by any of them.

Appendix D

Susan Trenholm,

Department of Management,

25th May 2010

Dear Susan,

REP(EM)/09/10-37 'Using Complexity Theory to Understand Organisations – Service Delivery in Tuberculosis Control in London.'

I am pleased to inform you that the above application has been reviewed by the E&M Research Ethics Panel that FULL APPROVAL is now granted.

Please ensure that you follow all relevant guidance as laid out in the King's College London *Guidelines on Good Practice in Academic Research* (http://www.kcl.ac.uk/college/policyzone/attachments/good_practice_May_08_FINAL.pdf).

For your information ethical approval is granted until 30th June 2012. If you need approval beyond this point you will need to apply for an extension to approval at least two weeks prior to this explaining why the extension is needed, (please note however that a full re-application will not be necessary unless the protocol has changed). You should also note that if your approval is for one year, you will not be sent a reminder when it is due to lapse.

If you do not start the project within three months of this letter please contact the Research Ethics Office. Should you need to modify the project or request an extension to approval you will need approval for this and should follow the guidance relating to modifying approved applications:
http://www.kcl.ac.uk/research/ethics/applicants/modifications.html

Any unforeseen ethical problems arising during the course of the project should be reported to the approving committee/panel. In the event of an untoward event or

an adverse reaction a full report must be made to the Chairman of the approving committee/review panel within one week of the incident.

Please would you also note that we may, for the purposes of audit, contact you from time to time to ascertain the status of your research.

If you have any query about any aspect of this ethical approval, please contact your panel/committee administrator in the first instance (http://www.kcl.ac.uk/research/ethics/contacts.html). We wish you every success with this work.

Yours sincerely

_____

Daniel Butcher

Research Ethics Administrator

CONSENT FORM FOR PARTICIPANTS IN RESEARCH STUDIES

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: The Use of Complexity Theory as a Tool for Understanding Organisations – The Case of TB Control in London

King's College Research Ethics Committee Ref: REP(EM)/09/10-37

- **Thank you for taking part in this research. The person organizing the research must explain the project to you before you agree to take part.**
- **If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.**
- **I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up to the point of publication.**
- **Please note that confidentiality and anonymity will be maintained and it will not be possible to identify you from any publications.**
- **I agree to be contacted in the future by King's College London researchers who would like to invite me to participate in follow up studies to this project, or in future studies of a similar nature.**

Participant's Statement:

I -

_____

agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

Appendix E: Interview Pro Forma

The table below presents a compilation of the five elements derived from each of the three theoretical models used in this research (complexity theory, professional dominance and New Public Management). Following the table is the interview schedule which was used to guide the semi-structured interviews. The numbers in parentheses which follow the questions indicate which of the 15 elements is being addressed by the specific question. In some cases, the questions address more than one of the elements, while in others the questions are of a more contextual, non-specific nature, and not specific to any of the 15 concepts.

	Professional Dominance	New Public Management	Complexity Theory
1. Autonomy granted only to certain professional groups, i.e. physicians	√		
2. Physicians take orders only from other physicians	√		
3. Physicians control work of others in the network	√		
4. Evidence of institutional power for physicians via knowledge and expertise	√		
5. Physician control over resource allocation	√		
6. "Managerialisation", or managers and management highly implicated in operations		√	
7. Quasi-markets, not planning, determine resource allocation		√	
8. Widespread use of targets, performance measures, audits		√	
9. Focus on the "rights" and role of the "consumer"		√	
10. Top-down pressure for reform		√	
11. Self-organisation			√
12. Non-linearity			√

13. Co-adaptation			√
14. Diversity of membership, "requisite variety", multi-disciplinary teams			√
15. Sensitivity to initial conditions, organisational history			√

1. What is your position within the network?
    a. How long have you been involved in TB control in London?
    b. How has this position and your role changed over time?

2. If you were to identify the leader of TB control in London, the person effectively in charge of and accountable for controlling the disease, who would that person be? Or would you say such a person does not really exist, that different people are responsible for different parts of the system and there is not really one, ultimate leader?
    a. Prompt and probe as needed *(11)*

3. Would you characterize the composition of the TB control network as diverse? Has the level of diversity changed over the time you have been involved in the network? *(14)*

4. Do you think any one group, profession, or individual carries particular power or influence over the way the network functions?
    a. Is there any group or profession which is notably short of power and influence despite being fully present and engaged members of the system?
    b. *Assuming clinicians are mentioned without prompting:* How does clinicians' power and influence manifest itself? Can you give me any examples?
        i. Prompt and probe (control over resources, over other professionals or members of the network, control resulting from their expertise and/or professional autonomy)
    c. Have you witnessed any changes over time in the dominance of clinicians? *(1-5)*

5. *If clinicians are not cited:* Do clinicians have more influence than others within the network? How does their power and influence manifest itself? Can you give me any examples of this?
    a. Prompt and probe (control over resources, over other professionals or members of the network, control resulting from their expertise and/or professional autonomy)

b. Have you witnessed any changes over time in the dominance of clinicians? *(1-5)*

6. How about other consultants, such as epidemiologists and microbiologists?
    a. How does their power and influence manifest itself? Can you give me any examples?
        i. Prompt and probe (control over resources, over other professionals or members of the network, control resulting from their expertise and/or professional autonomy)
    b. Have you seen any changes over time in their relative power and influence?(*1-5)*

7. I am interested in determining the nature and extent of relationships among those involved in TB control in London.
    a. How much interaction do you have with other members of the various TB control groups, outside of formal meetings?
    b. With how many people?
    c. Who? (i.e., others in the same professional group? different group?)
    d. How often?
    e. What is the nature of this interaction?
    f. Do you have any interactions which are not related to your work in TB?
    g. Do you think these relationships facilitate the functioning of the TB network, making it more effective?
    h. Is the structure of the system enough to ensure sufficient interaction among participants so that effective working relationships develop?
    (11)

8. There is some stated interest in increasing the involvement of "end users" or TB patients and their families, supporters, etc., within London's TB network.
    a. In the past, what has been the extent of such involvement?
    b. Has this changed over time?
    c. Do you think having greater patient involvement, or involvement by groups representing patients, is a good idea?
        i. Why? Why not?
    (9)
9. Thinking about your role as a member of the TB network, how much flexibility do you feel you have in carrying out your general, day-to-day responsibilities? Are your roles and responsibilities closely prescribed or would you say you have considerable latitude as long as you get the job done?
    (11, 13)
10. I am interested in understanding how the system responds when faced with an unforeseen occurrence, like a TB outbreak in a school for instance, or an unexpected spike in the MDR (multi-drug resistant) TB rate.
    a. Is there a set of simple "bottom line" rules which everyone knows they need to follow, or would you say the protocol is quite detailed and prescribed?

b. *If set of simple rules:* Do people have discretion or flexibility to respond as they see most fit as long as these "bottom line" rules are met?
c. Or are there rigidities there which hinder your ability, and that of the system itself, to respond quickly and effectively? (Things like requiring approvals, sign-offs, hierarchical concerns or a need to reach consensus.) *(11,13)*

11. Somewhat related to how the system responds to unforeseen circumstances is the issue of how, or whether, the system is able to evolve in response to the changing and dynamic nature of the overall TB infection landscape in London. There is some management research, along with research in evolutionary biology, which argues that a system's complexity has to be roughly equal to the complexity of the challenge it is facing. This has been shown to be particularly true in terms of surviving, never mind thriving, in a dynamic and changing environment.
    a. How would you describe or categorize the system's ability to respond to the myriad populations and constantly changing face of TB in London?
    b. Has this changed over time? *(11-15)*

12. *Questions for those with a long history of working in TB control*: My sense is that over the years the organisation responsible for managing TB in London has been through numerous changes and has taken on various forms and structures. I'd like to explore this historical aspect of the network.
    a. Could you describe for me some of the previous forms or structures of the TB network?
    (6,7,15)
    b. What do you see as the source of, or motivation for, these various changes? Politics? Practicalities/realities such as an outbreak or rising rates? *(6,7,10,15)*
    c. Would you characterize these changes as driven from the top? Or was there something more like a consensus among those involved that change was necessary?
    (6,7,10)
    d. When was the period of greatest change and upheaval within the network?
        i. How do you manage to carry on fulfilling your responsibilities during these changes?
        (6,7,15)
        ii. Do you have a sense that the productivity of those working within the network is affected by these reorganizations?
        (6,7,15)

13. Would you characterize the London TB control network as one with a critical mass of solid institutional memory?
    a. What is the degree of staff, or network member, turnover? *(15)*

14. With regard to the use of metrics, audits and performance measures, would you characterize their use within TB control as adequate, excessive or insufficient?
    a. Do they create a lot of extra work for you? How long have such measures been in place?
    b. Have they taken on greater or lesser importance over the years, or does this fluctuate?
    c. On balance, does the overall benefit of such measures justify their cost? *(8)*

15. Elements of "competition" have been introduced within the healthcare system over the past 20 years or so as part of the drive to make the NHS more business-like and efficient. The very existence of PCTs and a TB Commissioning Board and Unit bear witness to this.
    a. Within the system responsible for TB control, how have you seen this manifest itself?
    b. If you can think back to pre-Commissioning and pre-PCT days, can you identify some benefits of this more market-based approach?
    c. How about some of the challenges or drawbacks?
    (7)

16. Another change of the past two decades is that the role and influence of managers and management within the NHS and the healthcare system itself has grown. This has been accompanied by structural changes such as breaking apart line departments and separating the purchasing and providing functions of patient care, including for TB patients.
    a. What has been your experience with this approach?
    b. Do you think this has made the job of managing and controlling TB within London easier or more difficult?
    c. What do you see as the benefits of this sort of arrangement? Drawbacks? *(6)*

17. Would you characterize TB control in London as successful, on balance?
    a. What have been its great successes?
    b. Most significant shortcomings?
    c. What is your own view on why infection rates continue to climb in London, while other Western European and American cities have rates which are in decline?

18. Is there anything else you would like to add or think I should know?

Conclude interviews by thanking interviewees for their time and contribution, reminding them they will be invited to hear a presentation of my research findings at a future date.

Appendix F: An Overview of Key Groups and their Activities

The groups involved during the early stages of TB's reappearance in London were characterised by uneven leadership, bouncing between NHS London, the Health Protection Agency and its various precursors. However, since 2004/5, with the creation of the Stopping TB in London group, leadership has been situated within various parts of NHS London. Internal politics between NHS London and the Health Protection Agency has often been unhelpful, according to numerous informants. For example, the demise of the London TB Group arose because factions within this group pressed for the removal of the HPA as leader, for reasons highlighted in Case Study Two. The Stopping TB in London group was formed in its place, with membership virtually unchanged, but the organisational climate damaged. This point was illustrated during the course of this research, with various NHS employees encouraging an examination of London's response to the InR TB outbreak, arguing that it illustrates why the Health Protection Agency was not capable of leading the TB control file in London.

The membership of these various groups has been, and is, drawn almost exclusively from the NHS and various public health bodies/authorities, depending on where the responsibility for public health issues is situated. There is some (minor) effort given to involving TB service users in these groups, but observational data indicates that patient representatives have been present at less than a dozen of the meetings observed for this research. Members are drawn mostly from the medical profession - consultants from various specialisms and nurses – but there have always been NHS managers involved, along with variable representation from the Department of Health. The one organisation consistently involved, even before the creation of the Working Party in 1993, has been the British Thoracic Society [BTS]. However, their role has been largely focused on developing clinical guidelines and offering clinical input to the groups shown in Figure 19. Three research respondents noted that during the early days of the London epidemic, the BTS was pivotal is forcing attention on the issue and in urging policy makers to act, managing to keep at least some attention focused on the issue. But as history has shown, the group ultimately had limited impact. So various TB control bodies have been in existence since the upturn in TB rates was first noted; London's TB epidemic has not flourished for want of awareness of the problem within NHS London, public health bodies and the Department of Health.

Figure 19 shows that the first "purpose built" group formed to address the current TB epidemic was a group of London chest and public health physicians who, in 1993,

established the Working Party of Consultants in Communicable Disease Control. As illustrated, this group was the first of seven groups to emerge over next 19 years, all of them with similar mandates; namely, to halt and then reverse the rising tide of TB in London. In addition, there have also been several ad hoc, less formal groups, often focused on a single TB control issue such as London's InR TB outbreak and various workforce issues.

In a published account of the (1992) Working Party's efforts, McEvoy and Maguire (1995:303) conclude "the reasons for the rise (in TB) are not entirely clear". As a first step, the Working Party concluded there was a need for more data and outlined specifications for a minimum dataset and a pan-London surveillance system. Detailed recommendations regarding the proposed surveillance system were published a year later (Pearson et al 1996). According to a member of the Working Party interviewed for this research, the focus was on the need to collect better data to begin to understand, what was seen at the time, as a very surprising turn of events. The first order of business was to "insist on a much better surveillance system be put in place so that all cases were recorded and followed up." While a rudimentary system was indeed implemented immediately following the Working Party's efforts, 19 years later there is still debate within the TB community as to the nature and quality of the data collected. Furthermore, two separate surveillance systems have developed and operate distinctly and in some opposition to each other, providing an illustration of fragmentation within the TB control system. One system is for England, Wales and Northern Ireland, excluding London (known as Enhanced Tuberculosis Surveillance [ETS], established in 1999) and a separate system operates for London, known as the London TB Register. (The London system was established in 2001 as a "break away" model from the ETS, although both systems, oddly, are hosted by the HPA).

Operating two systems results in duplication of effort, extra cost and territorial spats, with ongoing disagreements as to which system is superior. The systems have limited capacity to "talk" to each other and integrating the two datasets takes time and effort. Despite years of ongoing discussions,, neither side appears willing to give sufficient ground to allow for the creation of a single, national system. McEvoy and Maguire (1995) made a prescient observation about the need for unity in the public health function and for a strong decision making function with respect to TB control. And whilst there is now a single TB surveillance system covering all of London – an improvement from the time their paper was written - the city's overall system of TB control is highly fragmented, as recently acknowledged by the NHS itself (NHS London,

2011[a]). As discussed later, this lack of "joined up" working has emerged as a serious problem highlighted repeatedly in reports and studies, and is seen as significantly impeding London's efforts at TB control.

Following on from the Working Party, with its focus on surveillance and data collection, a more formal group with a broader but time-limited mandate, and comprised of UK-wide membership, emerged in 1994. This group, The Interdepartmental Working Group on Tuberculosis, was sponsored by the Department of Health and its remit was "to set up the latest British Thoracic Society Code of Practice for the prevention and control of tuberculosis in the United Kingdom in the wider public health policy context and to consider and where necessary set up mechanisms for the above." (Department of Health 1996:3). This group issued two formal documents, the first two of the 14 reports detailed in Figure 17. The first report was issued fully 3 years after the rise in TB rates was discovered, likely reflecting the sense of disbelief by many within London's medical community regarding rising TB rates. One research respondent who participated on the Interdepartmental Working Group said, "this was a bit of an unknown quantity then, so we did guidelines". In fact, the group produced three high-level recommendations, rather than "guidelines" per se, supplemented by some further explanation within the final, written report (Department of Health 1996):

1. "All health authorities should have a written integrated policy for tuberculosis prevention and control". [Thirteen years later, a 2009 audit of England's Primary Care Trusts found, "the majority of PCTs still lacked a current strategy to tackle TB" and "Worryingly, about a fifth of PCTs with a high TB burden ($\geqslant$ 40 new cases per 100, 000 population) had no TB strategy whatsoever", the vast majority of which were in London. (Laycock et al 2009:7)];
2. Purchasers of healthcare should ensure contracts are consistent with this policy[40] [By 2009 only 29% of English PCTs had a service level agreement (SLA) spelling out which TB services were to be commissioned and 18% of PCTs in "high TB burden areas had no TB SLA" (Laycock et al 2009:7)]
3. The public health function and CCDCs "should be provided with adequate resources to carry out this work". (The majority of the above-cited reports, including those written most recently, cite lack of resources as an ongoing challenge in tackling London's high TB rates.)

[40] Of note here is the timing of this observation by the Interdepartmental Working Group. At that time, "purchasers" were a relatively new phenomenon in the UK healthcare system and the purchaser-provider split is a key source of the fragmentation which has come to characterise London's TB control system. Neither, as will be discussed later, has the TB control system been able to effectively use the contracting mechanism, as TB services are often grouped together by purchasers as part of a more general respiratory services grouping.

A number of respondents involved during the early days of TB's reappearance in London discussed the sense of incredulity within the medical community that TB could actually be spreading across London at the end of the 20th century. One said,

> *...it took quite a while for the reversal in notification trends to start to raise any alarm...my perception, whether it's right or not, is that some of the failure to act is because of the assumption that TB is largely an imported problem and that therefore the only thing that you really needed to do was to ensure migrant screening...*[41]

Indeed, in 1994 a leading journal for respiratory medicine, *Thorax*, published a paper, in which the lead author, one of the UK's foremost TB experts, discussed his country's "established and successful national tuberculosis control programme", claiming "good systems are in place for tuberculosis control in the UK..." (Ormerod et al 1994:1087). By this time, TB rates in the UK had been climbing for almost seven years. Where the rise in rates was recognized, the reasons were officially acknowledged as being unclear (Hayward & Watson 1995, McEvoy & Maguire 1995), an understandable position in light of the paucity and low quality data available. It was also widely acknowledged that "(w)orldwide, deterioration of control programs is recognised to have contributed to this resurgence"(Department of Health 1996:3), compounded by an increasingly mobile global population. Net migration to London between 1992-1997 increased by 52%, from 89,000 to 135,000 (The Migration Observatory). Rising HIV/AIDS rates were another contributor, as immuno-compromised HIV patients often develop a TB co-infection.

[41] Not that this was done, either.

Appendix G: The Case for Change and TB Model of Care

The combination of these two documents comprises the "London TB Plan", or the "policy alternative" as it is sometimes referred to in this thesis. The documents are listed in Figure 17 as the 13th and 14th reports analysing TB in London.

For the purposes of this research, these documents are notable because (a) the process of creating them was observed firsthand, including (unsuccessful) efforts to move them through the NHS London senior management approvals process, (b) relative to the previous 12 documents reviewed for this study, they offer a highly detailed TB care pathway and service delivery plan, (c) they were subject to a formal, internal *and* external consultation process (unlike previous reports, to the best of this research's knowledge). Exceptionally, the Model of Care also attempts to cost its recommendations, as well as "guesstimating" the current cost of TB control efforts across London (estimated to be in the range of £25million per annum). [42]

The Case for Change sets out the argument, in considerable detail over 53 pages, as to why TB in London should be urgently addressed. There is little new in its general thrust, although it benefits from incorporating findings from the PHAST report (Report Number 12 in Figure 17), and updated NICE guidance on reaching "hard to treat" TB patients. Nonetheless, the Case for Change reiterates much of what was argued previously, starting with the pivotal 1998 report, "Tuberculosis control in London – The Need for Change" (Report Number 3 in Figure 17).

The 89-page "London TB Model of Care" is more distinctive, although its major recommendation is the same as that of previous reports, (including the 1998 report cited above): namely, the need for centralised, pan-London commissioning for TB services. As discussed in Chapter Eight, it is also distinguished itself amongst the 14 reports by its use of clearly NPM-influenced language, for example by referring to the need to improve productivity and cost reduction (despite widespread agreement that TB control in London is currently underfunded).

[42] This research observed significant resources devoted to trying to reach an accurate estimate of the current cost of TB services across London. In the end it was deemed impossible, and the £25 million figure represents a derivation from the well documented costs of TB services in North Central and North East London. Commissioners from across the other three geographic sectors simply were not able to report how much they spend on TB services, underscoring the relative unimportance of TB services to most commissioners.

The majority of the document is clinically focused, suggesting updated approaches to TB service delivery, enhanced screening techniques, an acknowledgement of the need for better, standardised treatment of TB, especially drug resistant TB, across London, and greater use of DOT. Also for the first time, it is recommended that the Commissioning Board oversee a fund which would provide short-term accommodation for homeless, migrant TB patients who are classified as having "no recourse to public funds" and have been deemed as posing a public health danger because of difficulties in getting these patients to either take or complete treatment. Currently, these patients, about 10 per year, are often hospitalised for the duration of their treatment and it would be significantly more cost effective it they were provided with temporary accommodation in the community.

On balance, the Model of Care reflects updated thinking about how London should tackle TB and provides significant detail as to how this should be done. Also, despite ultimately not recommending a TB "Control Board", the Model of Care does suggest that a newly reconfigured TB Commissioning Board take on some of the functions of a "control board" and adopt a more holistic approach to TB control across London, including seeking input from non-healthcare sector representatives. But notably, it is the narrower language and focus of "commissioning", and not the broader concept of "control" which continues to be used when describing how TB should be managed across London.

APPENDIX H: Isoniazid-Resistant TB Patient Profile

The patient profile of this group varies significantly from that of the general TB patient population in London, according to the last available internal data from the Health Protection Agency (2011). They are a particularly complex and challenging patient population to treat and require a well functioning TB control system if they are to be managed successfully:

- 42% have a history of imprisonment
- 68% have a history of drug or alcohol problems
- 31% have a history of mental health problems
- 34% have a history of homelessness
- 70% male (versus 55% in the general TB population)
- 85% with pulmonary, therefore contagious, TB (versus approximately 57% in the general TB population)
- 53% born in the UK (versus 16% of the general TB population)
- 35% white ethnic group (versus 14% of the general London TB population)
- 28% black Caribbean ethnic group (versus 4% of the general London TB population)

Clearly, this is a patient population which largely lives at the margins of "polite society", and differs significantly from the general London TB population. Epidemiological modelling has revealed fascinating links amongst many of the InR-TB patients. A copy of the "spider diagram", produced by the former Public Health Laboratory Service, illustrates these connections and can be found in Appendix I. The composition of this patient group has changed somewhat over the past decade, but many of the connections still flow from associations with HMP Pentonville, a specific north London music scene and used car dealerships in the area.

On an individual level, the following illustrative patient case histories were discovered within archival reports accessed for this research. They paint a vivid picture of some "typical" I-RTB patients and the challenges, especially resource challenges, they present to the TB control system.

Case EF

- Drug user, no fixed address, chaotic lifestyle
- Fails to attend appointments but says he wants treatment

- TB nurse visits addresses he has given but he is not there
- At one point it was decided not to treat him, given risk of developing MDRTB: this was followed by phone calls from the patient insisting he wanted treatment to continue
- In and out of prison frequently
- Has refused all offers of drug rehabilitation

Case SC

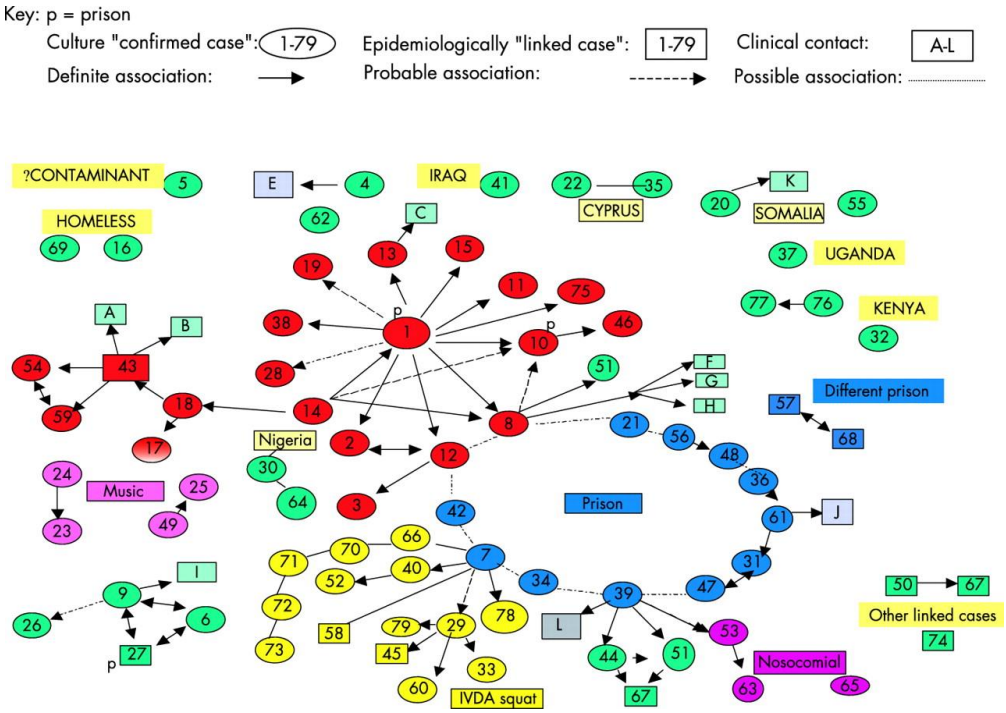
- Listed as contact of another case but failed to attend screening and non-responsive to other attempts at contact
- Eventually admitted very unwell via A&E, with long history of bloody cough; diagnosed with contagious TB
- Drug user (cocaine and heroin), recently evicted by Local Authority for rent arrears of £17,000
- Refused to stay in side-room on ward; wanted to smoke and socialise with others
- Consultant in Communicable Disease Control wanted to section her under the Public Health Act but was informed this was impossible as SC was an inpatient at hospital
- Would frequently abscond from the ward for prolonged periods to obtain drugs which she then smoked on the ward
- Cannot be discharged as she is homeless; Local Authority will not re-house for three years after eviction. Remains in hospital although physically well enough for discharge

Post-script to this case: SC went on to develop MDRTB and had to be forcibly detained in a hospital under armed guard where she was forced to take TB medication. Before developing MDRTB, but after leaving hospital after her I-RTB treatment, she continued to abuse hard drugs, remained homeless and returned to sex work. It is not known how many clients she infected. In total, her health and social care treatments are estimated to have exceeded £2 million. Her current whereabouts and TB status are unknown (Source: research respondent)

Case CC

- History of depression and overdose, also long prison record Refused to stay in side-room on ward, frequently went to smoke in ward foyer and socialised with other smokers
- Very negative view of healthcare professionals – threatened violence towards his previous GP – nursing staff intimidated by his aggressive behaviour
- Transmission of TB to another patient in the hospital has occurred
- Homeless after separation from his girlfriend, but now re-housed. Having DOT in the community, but refuses to come to hospital for it, no longer registered with GP
- Home visits by TB nurse extremely time consuming as she frequently has to make three or more visits in a day to find him in. Verbally abusive, manipulative and demanding, e.g. threatening not to take his tablets until she has assisted him with tasks such as filling in benefit forms
- Likely to be going back to prison shortly on another assault conviction

Appendix I: Spider Diagram of InR-TB Outbreak in London



Source: Ruddy et al 2004

APPENDIX J: Sample recommendation page from the 2004 HPA report on the isoniazid resistant TB outbreak

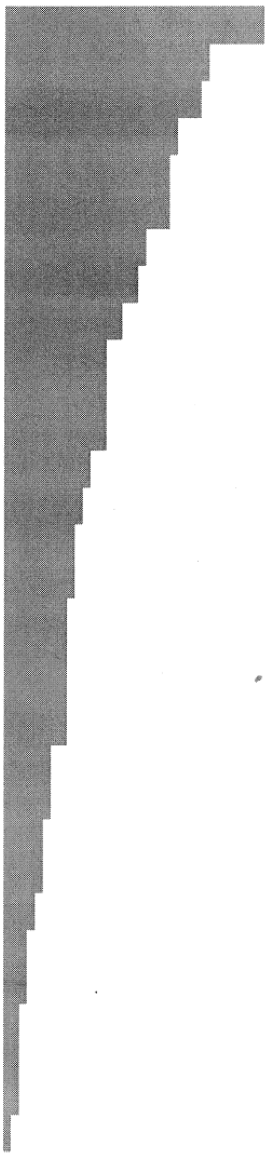
Table R2: Treatment and control measures

Recommendation	Action	Rationale	Responsibility	Comments
CONTROL MEASURES				
TREATMENT				
Appropriate treatment for INH-R TB	Prolonged treatment as in BTS guidelines (Thorax 1998;**53:** 544)	Extended treatment/drug regimens where INH-R to reduce relapse, emergence MDR-TB	Trust TB teams	
	Information pack sent to local TB teams to advise about control measures	Ensure teams aware of links to INH-R TB incident and likely need extended control measures	HPA-London (Helen Maguire) HPA-HPUs (CsCDC)	
Community cases: Improve treatment completion using DOT and a case management approach with support, incentives and sanctions. **This is a 'Step down' rather than 'Step up' approach.**	Use DOT in those patients who: • Are at-risk of poor adherence (BTS criteria) • Are part of INH-R incident unless the clinician confident good adherence & has demonstrated this. DOT does not have to be given by a TB nurse or physician.	Treatment completion is essential to control the incident. Treatment completion in this incident is below 50%. Poor treatment adherence increases the risk of adverse outcomes (MDR-TB, increased morbidity and mortality). Many of the cases have risk factors and documented poor adherence. Adherence can be improved by implementing social and housing support and incentives, as well as health service measures such as free or supervised treatment.	TB network managers, with: • TB clinical teams • TB case managers • HPA-HPUs (CsCDC) • HPA-London (LTBR) • PCTs • Local authorities • Voluntary sector	Will require action from NHS and non-NHS organisations BTS guidelines recommend DOT in: • Homeless • Alcohol or drug misusers • 'Drifters' • Serious mental illness • MDR-TB • Past or present history of poor adherence Consider DOT for new entrants, refugees

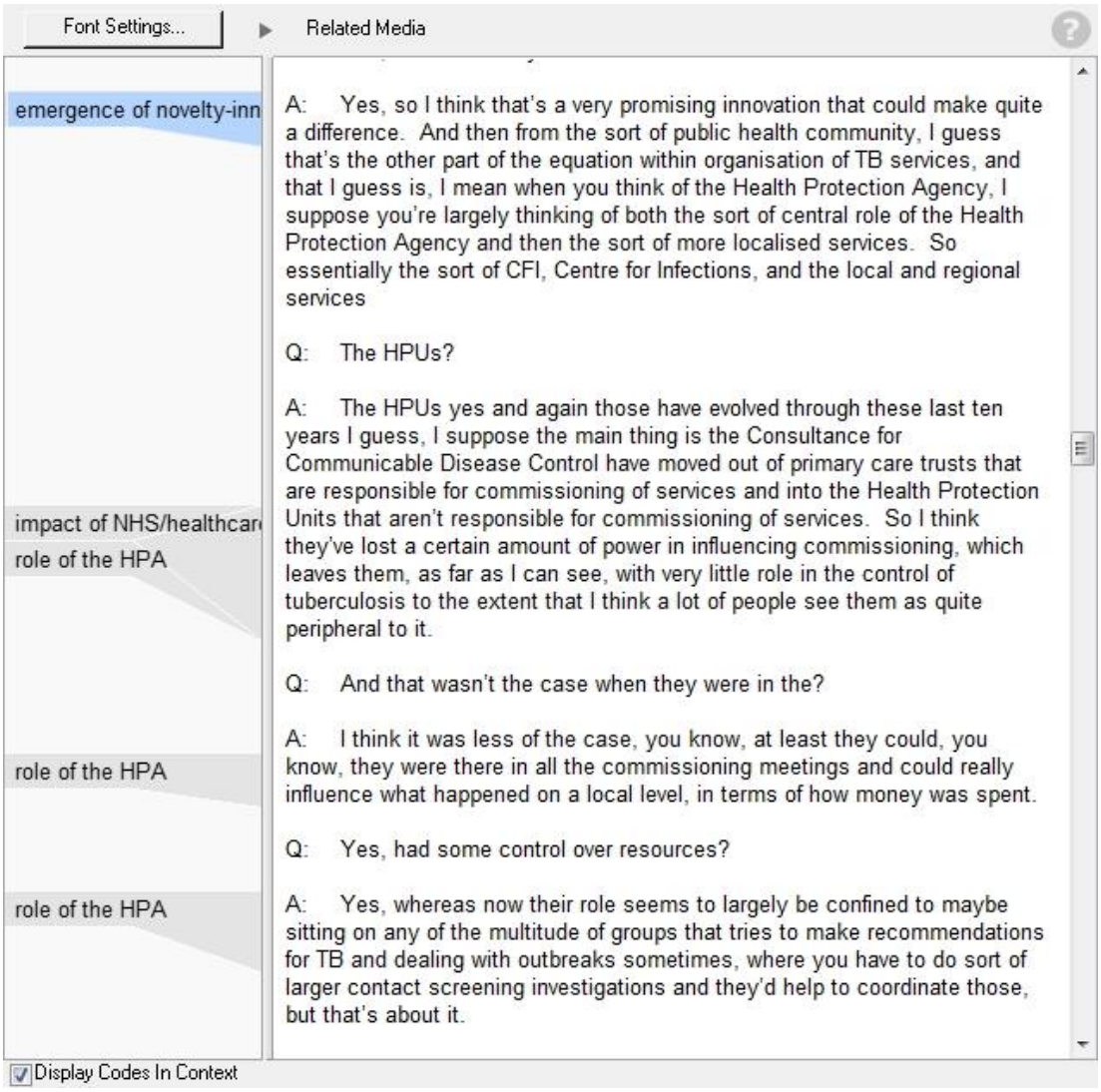
APPENDIX K: Twelve Strategic Goals of the Health Protection Agency

1. To reduce the incidence and consequences of infection
2. To anticipate and prevent the adverse effects of acute and chronic exposure to hazardous chemicals and other poisons
3. To reduce the adverse effects of expose to ionising and non-ionising radiation
4. To identify and respond to new and emerging diseases and other health threats
5. To identify and develop appropriate responses to childhood diseases associated with infections, chemical or radiation hazards
6. To improve preparedness of responses to health protection emergencies including those caused by deliberate release
7. To strengthen information and communication systems for identifying and tracking diseases and exposures to infectious, chemical and radiological hazards
8. To build and improve the evidence base through a comprehensive programme of research
9. To develop a skilled and motivated workforce
10. To manage knowledge and share expertise
11. To build on and develop the intellectual assets of the organisation in partnership with industry and other customers
12. To raise the understanding of health protection and involvement of the public and ensure they have access to authoritative and timely information and advice

Appendix L: Code Frequency as Generated by HyperResearch

Code	Total	Bar Graph
fragmentation-lack of uniformity	414	
TB low priority	318	
internal politics	310	
frustration-disappointment	278	
impact of NHS/healthcare restructuring	262	
pace of change/aversion to change	257	
lack of leadership	221	
role of DH	215	
role of the HPA	185	
clinicians dominate other profs	159	
lack of accountability	157	
quasi-markets	165	
use of targets-measurement-audit	137	
to be determined	122	
acknowledgement of failure	107	
clinicians' institutional power	106	
ego-turf protection-empire building	103	
public health model vs. medical model	95	
rights and role of consumers	102	
self-organisation	103	
emergence of novelty-innovation	78	
lack of focus on consumer	71	
soc & cult deference to clinicians	67	
TB politically sensitive	62	
management influence	55	
non-linearity	34	
Top down pressure for reform	33	
clinicians' control resource allocation	21	
diversity within network	31	
lack of diversity	24	
professional dominance - general	13	
Total: 31	**4305**	

Appendix M: HyperResearch Coding Snapshot



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